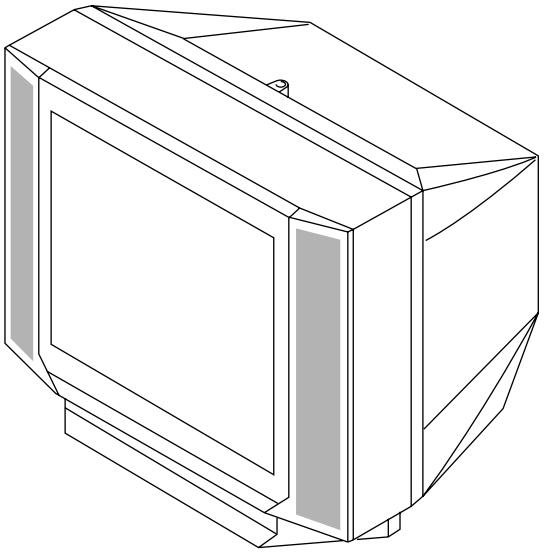
Self Diagnosis
Supported model

SERVICE MANUAL BG2T CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-HA21M50	RM-969	Malaysia	SCC-U71D-A
KV-HA21M60	RM-969	Thailand	SCC-U73L-A
KV-HA21M80	RM-969	E	SCC-U68D-A
KV-HA21M80	RM-969	Vietnam	SCC-U75B-A
KV-HA21M80/H (DOLPHIN GRAY)	RM-969 (BLACK)	ME	SCC-U67K-A
KV-HA21M81	RM-969	ME	SCC-U67J-A
KV-HA21P52	RM-969	Thailand	SCC-U73K-A



TRINITRON® COLOR TV

SONY®

SPECIFICATIONS

			Note
Power requirements	220-240 V AC, 50/60Hz		(KV-HA21M60/HA21P52)
	110-240 V AC, 50/60 Hz		(KV-HA21M50/HA21M80/ HA21M80/H/HA21M81)
Power consumption (W)	Indicated on the rear of the TV		
Television system	B/G, I, D/K, M		
Color system	PAL, PAL 60, NTSC3.58, NTSC4.43, SECAM		
Stereo Bilingual	NICAM Stereo/Bilingual B/G, I, D/K; A2 Stereo/ Bilingual B/G		(KV-HA21M60)
Teletext	English, Arabic, French		(KV-HA21M81 Only)
Channel coverage			
B/G	VHF: E2 to E12 UHF: E21 to E69 CATV: S01 to S03, S1 to S41		
I	UHF: B21 to B68 CATV: S01 to S03, S1 to S41		(Except KV-HA21P52)
D/K	VHF: C1 to C12, R1 to R12 UHF: C13 to C57, R21 to R60 CATV: S01 to S03, S1 to S41, Z1 to Z39		(Except KV-HA21P52)
M	VHF: A2 to A13 UHF: A14 to A79 CATV: A-8 to A-2, A to W+4, W+6 to W+84		(Except KV-HA21P52)
(Antenna)	75-ohm external terminal		
Audio output (Speaker)	5W + 5W		
Number of terminal			
Video	Input: 2* Output: 1	Phono jacks; 1 V_{P-P}, 75 ohms	* One input line available
Audio	Input: 2* Output: 1	Phono jacks; 500 mVrms	* One input line available
(Headphone)	Output: 1	Stereo minijack	
Picture tube	21 in.		
Tube size (cm)	54		Measured diagonally
Screen size (cm)	51		Measured diagonally
Dimension (w/h/d, mm)	639 × 458 × 490		
Mass (kg)	26		

Design and specifications are subject to change without notice.

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

SELF DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER lamp will automatically begin to flash.
The number of times the lamp flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER lamp flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the remote commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

1. DIAGNOSTIC TEST INDICATORS

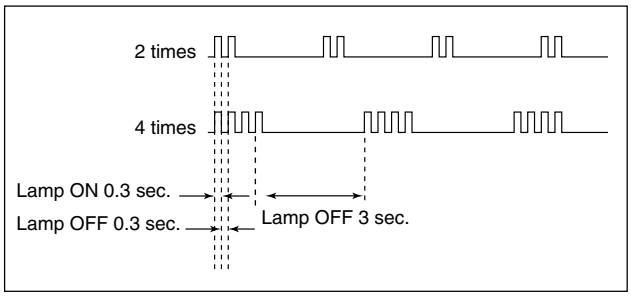
When an errors occurs, the STANDBY/TIMER lamp will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the lamp will identify the first of the problem areas.

Result for all of the following diagnostic items are displayed on screen. No error has occured if the screen displays a "0".

Diagnostic Item Description	No. of times STANDBY/TIMER lamp flashes	Self-diagnostic display/Diagnostic result	Probable Cause Location	Detected Symptoms
• Power does not turn on	Does not light	—	• Power cord is not plugged in. • Fuse is burned out F4601 (F)	• Power does not come on. • No power is supplied to the TV. • AC power supply is faulty.
• +B overcurrent (OCP) • Horizontal deflection overdrive	2 times	002:000 or 002:001~255	• H.OUT Q801 is shorted. (A board)	• Power does not come on. • Load on power line is shorted. • Has entered standby state after horizontal raster. • Power line is shorted or power supply is stopped.
• White balance failure (no PICTURE) • Vertical deflection stopped	4 times	004:000 or 004:001~225	• -13V is not supplied. (A board) • IC 551 faulty (A board)	• Vertical deflection pulse is stopped
• Micro reset	—	101:00 or 101:001~225	• Discharge CRT (CV Board) • Static discharge • External noise	• Power is shut down shortly, after this return back to normal. • Detect Micro latch up.

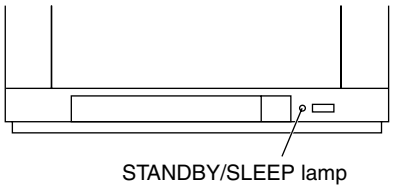
Note 1: If a + B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously.
The symptom that is diagnosed first by the microcontroller is displayed on the screen.
Note 2: Refer to screen (G2) Adjustment in section 3-4 of this manual.

2. DISPLAY OF STANDBY/TIMER LIGHT FLASH COUNT



Diagnostic Item	Flash Count*
+B overcurrent/overvoltage	2 times
Vertical deflection stopped	4 times

* One flash count is not used for self-diagnostic.



3. STOPPING THE STANDBY/TIMER FLASH

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER lamp from flashing.

4. SELF-DIAGNOSTIC SCREEN DISPLAY

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurances of failure for confirmation on the screen:

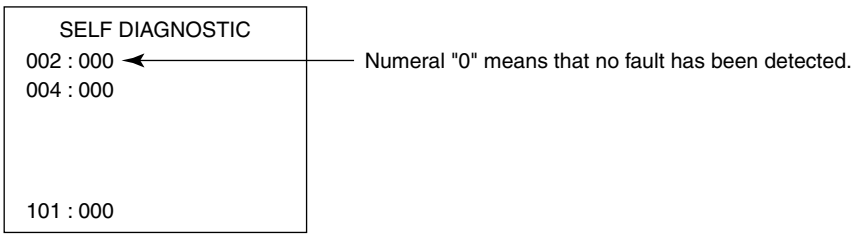
[To Bring Up Screen Test]
In standby mode, press buttons on the remote commander sequentially in rapid succession as shown below:

Screen display ➡ channel 5 ➡ Sound volume - ➡ Power ON

⇧

Note that this differs from entering the service mode (mode volume +).

Self-Diagnosis screen display



5. HANDLING OF SELF-DIAGNOSTIC SCREEN DISPLAY

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.

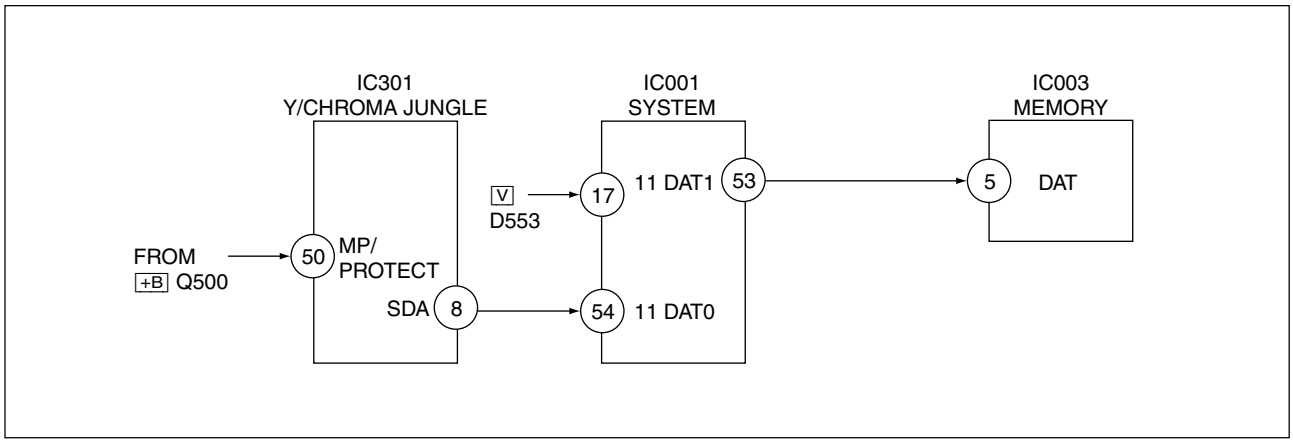
Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

[Clearing the result display]
To clear the result display to “0”, press buttons on the remote commander sequentially as shown below when the diagnostic screen is being displayed.

Channel [8] ➡ 0

[Quitting Self-diagnostic screen]
To quit the entire self-diagnostic screen, turn off the power switch on the remote commander or the main unit.

6. SELF-DIAGNOSTIC CIRCUIT



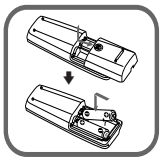
[+B overcurrent (OCP)]	Occurs when an overcurrent on the +B(135) line is detected by Q500. If Q500 go to ON and the voltage to pin 50 of IC301 more than 3.5V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.
[Vertical deflection stopped]	Occurs when an absence of the vertical deflection pulse is detected by Pin 17 and IC001 shut down the power supply.
[White balance failure]	If the RGB levels* do not balance or become low level within 5 seconds, this error will be detected by IC301. TV will stay on, but there will be no picture.

* (Refers to the RGB levels of the AKB detection Ref pulse that detects IK.)

The operating instruction mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

SECTION 1 GENERAL

A Getting Started (KV-HA21M80/H/HA21M81)

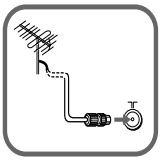


Step 1

Insert the batteries (supplied) into the remote.

Note

- Do not use old batteries nor use different types of batteries together.

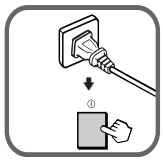


Step 2

Connect the antenna cable (not supplied) to ╥ (antenna input) at the rear of the TV.

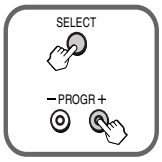
Tip

- You can also connect your TV to other optional components. (See E)



Step 3

Plug in the power cord, then press ⏻ on the TV to turn it on.

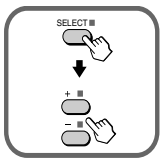


Step 4

Press SELECT and PROGR + on the TV at the same time for one to two seconds to preset the channels automatically. (See J)

Tip

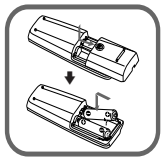
- To stop the automatic channel presetting, press SELECT.



Step 5

Press SELECT on the remote until "LANGUAGE/اللغة: ENGLISH" appears on the screen, then press + or – to change the on-screen display language.

A Getting Started (KV-HA21M50/HA21M80)

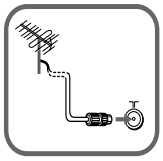


Step 1

Insert the batteries (supplied) into the remote.

Note

- Do not use old batteries nor use different types of batteries together.

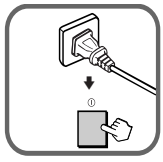


Step 2

Connect the antenna cable (not supplied) to ╥ (antenna input) at the rear of the TV.

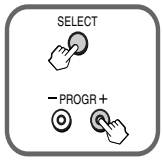
Tip

- You can also connect your TV to other optional components. (See E)



Step 3

Plug in the power cord, then press ⏻ on the TV to turn it on.



Step 4

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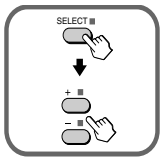
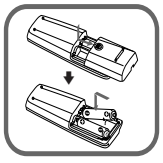


Step 5

Press SELECT on the remote until "LANGUAGE/语言: ENGLISH" appears on the screen, then press + or – to change the on-screen display language.

A Getting Started (KV-HA21M60/HA21P52)

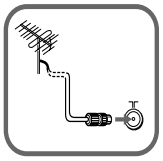


Step 1

Insert the batteries (supplied) into the remote.

Note

- Do not use old batteries nor use different types of batteries together.

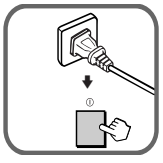


Step 2

Connect the antenna cable (not supplied) to ╥ (antenna input) at the rear of the TV.

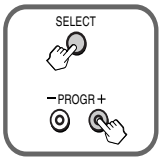
Tip

- You can also connect your TV to other optional components. (See E)



Step 3

Plug in the power cord, then press ⏻ on the TV to turn it on.



Step 4

Press SELECT and PROGR + on the TV at the same time for one to two seconds to preset the channels automatically. (See J)

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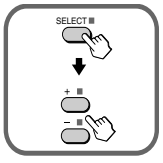
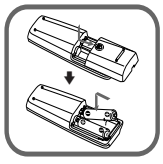


Step 5

Press SELECT on the remote until "LANGUAGE/ภาษา: ENGLISH" appears on the screen, then press + or – to change the on-screen display language.

A Getting Started (KV-HA21M80 (Vietnam only))

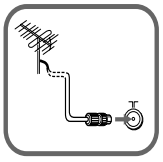


Step 1

Insert the batteries (supplied) into the remote.

Note

- Do not use old batteries nor use different types of batteries together.

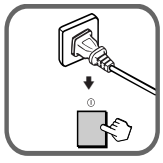


Step 2

Connect the antenna cable (not supplied) to ╥ (antenna input) at the rear of the TV.

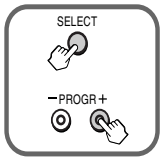
Tip

- You can also connect your TV to other optional components. (See E)



Step 3

Plug in the power cord, then press ⏻ on the TV to turn it on.



Step 4

Press SELECT and PROGR + on the TV at the same time for one to two seconds to preset the channels automatically. (See J)

Tip

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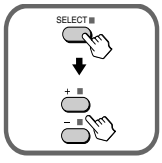
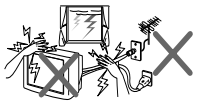


Step 5

Press SELECT on the remote until "Ngôn ngữ/ LANGUAGE: Tiếng Việt" appears on the screen, then press + or – to change the on-screen display language.

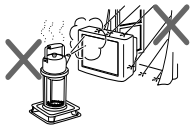
B WARNING

- Dangerously high voltages are present inside the TV.
- TV operating voltage: 110 – 240 V AC. (KV-HA21M50/HA21M80/HA21M80/H/HA21M81)
  220-240 V AC. (KV-HA21M60/HA21P52)
- Do not plug in the power cord until you have completed making all other connections; otherwise a minimum leakage current might flow through the antenna and other terminals to ground.
- To avoid battery leakage and damage to the remote, remove the batteries from the remote if you are not going to use it for several days. If any liquid that leaks from the batteries touches you, immediately wash it away with water.

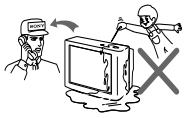


For your own safety, do not touch any part of the TV, the power cord and the antenna cable during lightning storms.

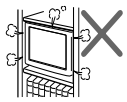
For children's safety, do not leave children alone with the TV. Do not allow children to climb onto it.



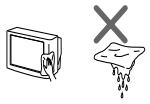
To prevent fire or shock hazard, do not expose the TV to rain or moisture.



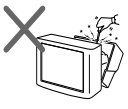
Do not operate the TV if any liquid or solid object falls into it. Have it checked immediately by qualified personnel only.



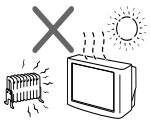
Do not block the ventilation openings of the TV. Do not install the TV in a confined space, such as a bookcase or built-in cabinet.



Clean the TV with a dry and soft cloth. Do not use benzine, thinner, or any other chemicals to clean the TV. Do not scratch the picture tube.



Do not open the cabinet and the rear cover of the TV as high voltages and other hazards are present inside the TV. Refer servicing and disposal of the TV to qualified personnel.



Your TV is recommended for home use only. Do not use the TV in any vehicle or where it may be subject to excessive dust, heat, moisture or vibrations.

WARNING (continued)

Do not place any objects on the TV.

Do not plug in too many appliances to the same power socket. Do not damage the power cord.

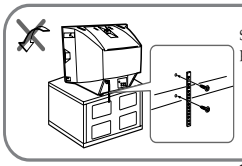
Install the TV on a stable TV stand and floor which can support the TV set weight. Ensure that the TV stand surface is flat and its area is larger than the bottom area of the TV.

Pull the power cord out by the plug. Do not pull the power cord itself. Even if your TV is turned off, it is still connected to the AC power source (mains) as long as the power cord is plugged in. Unplug the TV before moving it or if you are not going to use it for several days.

C Securing the TV

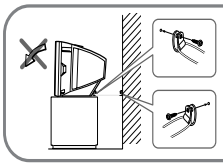
▶ **KV-HA21 only**

To prevent the TV from falling, use the supplied screws, clamps and band to secure the TV.



Screw the band to the TV stand and to the provided hole at the rear of your TV.

or

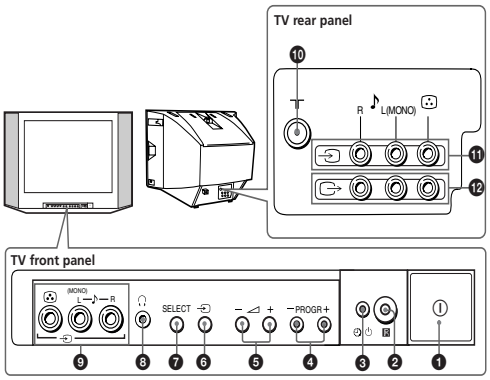


(1) Put a cord or chain through the clamps.
(2) Screw one clamp to a wall or pillar and the other clamp to the provided hole at the rear of your TV.

Note

- Use only the supplied screws. Use of other screws may damage the TV.

D TV front and rear panels

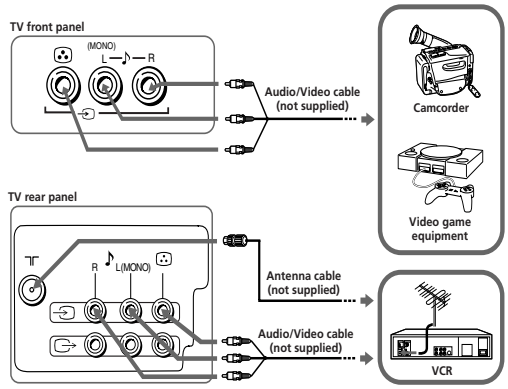


Button	Function
❶ ⏻	Turn off or turn on the TV.
❷	Remote control sensor.
❸ ⏻	Standby indicator.
❸	Wake Up indicator.
❹ PROGR +/–	Select program number.
❺ +/–*	Adjust volume.
❻	Select TV or video input.
❼ SELECT	Select the desired item.
❽	Headphone terminal.
❾, ⓫	Video input terminal.
❿	Antenna input terminal.
⓬	Monitor output terminal.

* You can also use the +/– buttons on the TV to work as the +/– buttons on the remote.

E Connecting optional components

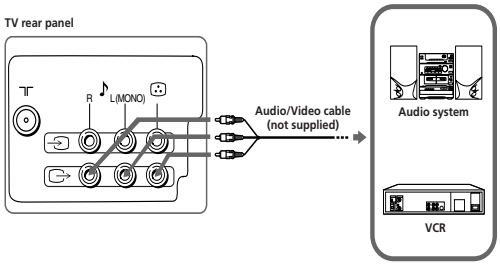
Connecting to the video input terminal ( )



Note

- Do not connect video equipment to (video input) at the front and the rear of your TV at the same time; otherwise the picture will not be displayed properly on the screen.

Connecting to the monitor output terminal ( )



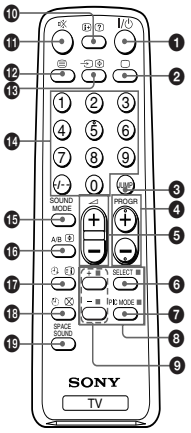
F Troubleshooting

If you find any problem while viewing your TV, please check the following guide. If any problem persists, contact your Sony dealer.

Symptom	Solutions
Snowy picture, noisy sound	• Check the antenna cable and connection on the TV, VCR and on the wall. • Preset the channel manually again. (See J) • Check the antenna setup. Contact a Sony dealer for advice.
Good picture, noisy sound	• Select the appropriate TV system. (KV-HA21M50/HA21M60/HA21M80/HA21M80/H/HA21M81) (See J)
No picture, no sound	• Check the power cord, antenna and the VCR connections. • Press I/⏻ (power) or ⏻ (main power) to turn on the TV.
Good picture, no sound	• Press + to increase the volume level. • Press 🔇 to cancel the muting.
Dotted lines or stripes	• Do not use a hair dryer or other equipment near the TV. • Check the antenna setup. Contact a Sony dealer for advice.
Double images or "ghosts"	• Use the fine tuning ("FINE") function. (See J) • Turn off or disconnect the booster if it is in use. • Check the antenna setup. Contact a Sony dealer for advice.
No color	• Select the appropriate color system. (See J) • Adjust the color level. (See K) • Check the antenna setup. Contact a Sony dealer for advice.
Abnormal color patches	• Keep external speakers or other electrical equipment away from the TV. Press ⏻ (main power) to turn off the TV for about 15 minutes, then turn it on again to demagnetize the TV.
Teletext display is incomplete (snowy picture or double images). (KV-HA21M81 only)	• Check the antenna cable and connection on the TV, VCR and on the wall. • Use the fine tuning ("FINE") function. (See J) • Check the antenna setup. Contact a Sony dealer for advice.
The ⏻ (standby) indicator on your TV flashes red several times after every three seconds.	• Count the number of times the ⏻ (standby) indicator flashes. Press ⏻ (main power) to turn off your TV. Contact your nearest Sony service center.
TV cabinet creaks.	• Changes in room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.
A "boom" sound is heard when the TV is turned on.	• The TV's demagnetizing function is working. This does not indicate a malfunction.

H Remote control

(KV-HA21M50/HA21M80/HA21M80/H/HA21M81)



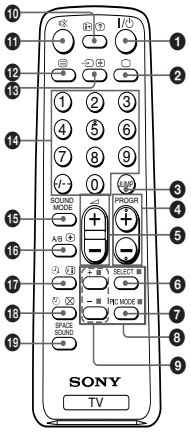
Button	Function	See
❶ I/⏻	Turn off temporarily or turn on the TV.	–
❷ ▢	Display the TV program.	–
❸ JUMP	Jump to previous program number.	–
❹ PROGR +/–	Select program number.	–
❺ + /–	Adjust volume.	–
❻ SELECT	Select the desired item.	–
❼ PIC MODE	Select picture mode.	K
❾ +/–	Adjust items.	–
❿	Display on-screen information.	–
⓫ 🔇	Mute the sound.	–
⓭	Select TV or video input.	–
⓮ 0 – 9, -/--	Input numbers.	–
Timer operations		
⓱	Set TV to turn on automatically.	I
⓲	Set TV to turn off automatically.	I
⓯ SOUND MODE	Select sound mode.	K
⓳ SPACE SOUND	Select space sound mode.	K
⓰ A/B	Not function for your TV.	–
Teletext operations (green label) (KV-HA21M81 only)		
❽ ■ (red, green, yellow, blue)	Access a FASTEXT menu.	M
❿ ?	Reveal concealed information	M
⓬	Display Teletext broadcast.	M
⓭	Stop Teletext display from scrolling.	M
⓰	Enlarge the Teletext display.	M
⓱	Display Teletext service contents.	M
⓲ ⊠	Show TV screen while waiting for Teletext page.	M

F Troubleshooting

If you find any problem while viewing your TV, please check the following guide. If any problem persists, contact your Sony dealer.

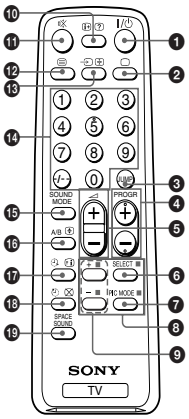
Symptom	Solutions
Snowy picture, noisy sound	• Check the antenna cable and connection on the TV, VCR and on the wall. • Preset the channel manually again. (See J) • Check the antenna setup. Contact a Sony dealer for advice.
Good picture, noisy sound	• Press A/B until the sound is optimal. (KV-HA21M60/HA21P52
No picture, no sound	• Check the power cord, antenna and the VCR connections. • Press I/⏻ (power) or ⏻ (main power) to turn on the TV.
Good picture, no sound	• Press + to increase the volume level. • Press 🔇 to cancel the muting.
Dotted lines or stripes	• Do not use a hair dryer or other equipment near the TV. • Check the antenna setup. Contact a Sony dealer for advice.
Double images or "ghosts"	• Use the fine tuning ("FINE") function. (See J) • Turn off or disconnect the booster if it is in use. • Check the antenna setup. Contact a Sony dealer for advice.
No color	• Select the appropriate color system. (See J) • Adjust the color level. (See K) • Check the antenna setup. Contact a Sony dealer for advice.
Abnormal color patches	• Keep external speakers or other electrical equipment away from the TV. Press ⏻ (main power) to turn off the TV for about 15 minutes, then turn it on again to demagnetize the TV.
The ⏻ (standby) indicator on your TV flashes red several times after every three seconds.	• Count the number of times the ⏻ (standby) indicator flashes. Press ⏻ (main power) to turn off your TV. Contact your nearest Sony service center.
TV cabinet creaks.	• Changes in room temperature sometimes make the TV cabinet expand or contract, making a noise. This does not indicate a malfunction.
A "boom" sound is heard when the TV is turned on.	• The TV's demagnetizing function is working. This does not indicate a malfunction.

H Remote control (KV-HA21P52)



Button	Function	See
❶ I/⏻	Turn off temporarily or turn on the TV.	–
❷ ▢	Display the TV program.	–
❸ JUMP	Jump to previous program number.	–
❹ PROGR +/–	Select program number.	–
❺ + /–	Adjust volume.	–
❻ SELECT	Select the desired item.	–
❼ PIC MODE	Select picture mode.	K
❾ +/–	Adjust items.	–
❿	Display on-screen information.	–
⓫ 🔇	Mute the sound.	–
⓭	Select TV or video input.	–
⓮ 0 – 9, -/--	Input numbers.	–
Timer operations		
⓱	Set TV to turn on automatically.	I
⓲	Set TV to turn off automatically.	I
⓯ SOUND MODE	Select sound mode.	K
⓳ SPACE SOUND	Select space sound mode.	K
Bilingual operations		
⓰ A/B	Select bilingual mode.	M
Teletext operations		
❽ ■ (red, green, yellow, blue) ❿ ? ⓬ ⓭ ⓰ ⓱ ⓲ ⊠	Not function for your TV.	–

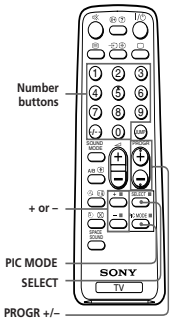
H Remote control (KV-HA21M60 only)



Button	Function	See
❶ I/⏻	Turn off temporarily or turn on the TV.	–
❷ ▢	Display the TV program.	–
❸ JUMP	Jump to previous program number.	–
❹ PROGR +/–	Select program number.	–
❺ ◿ +/–	Adjust volume.	–
❻ SELECT	Select the desired item.	–
❼ PIC MODE	Select picture mode.	K
❽ +/–	Adjust items.	–
❾ ⓘ	Display on-screen information.	–
❿ 🔇	Mute the sound.	–
⓫ ⏎	Select TV or video input.	–
⓬ 0 – 9, -/--	Input numbers.	–
Timer operations		
⓭ ◴	Set TV to turn on automatically.	I
⓮ ◴	Set TV to turn off automatically.	I
⓯ SOUND MODE	Select sound mode.	K
⓰ SPACE SOUND	Select space sound mode.	K
Stereo/bilingual operations		
⓱ A/B	Select stereo/bilingual mode.	L
Teletext operations		
❽ ■ (red, green, yellow, blue)	Not function for your TV.	–
❿ ?		
⓬ ☰		
⓭ ⊜		
⓮ ⊜		
⓯ ⊜		
⓰ ⊟		
⓱ ⊠		

J Presetting channels

You can automatically preset up to 100 TV channels in numerical sequence from program number 1, or manually preset desired channels and channels that cannot be preset automatically.



Presetting channels automatically from a specified program number

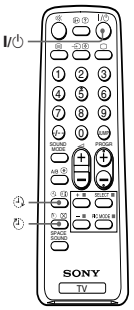
1. Press SELECT until "AUTO PROGRAM" appears on the screen.
2. Press + or – once to enter the "AUTO PROGRAM" mode.
   The on-screen display will start flashing.
3. Press PROGR +/– or the number buttons until the desired program number appears on the screen.
4. Press + or – to start presetting channels automatically.

Presetting channels manually

1. Press SELECT until "MANUAL PROGRAM" appears on the screen.
2. Press + or – once to enter the "MANUAL PROGRAM" mode.
3. Press PROGR +/– or the number buttons until the desired program number appears on the screen.
4. Press + or – until the desired channel picture appears on the screen.
5. To preset other channels manually, repeat steps 3 to 4.

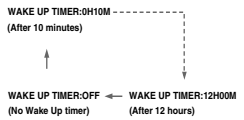
I Setting the timers

You can turn on and off your TV by using the ◴ and ◴ buttons respectively.



Setting the Wake Up timer

1. Press ◴ until the desired period of time appears on the screen.

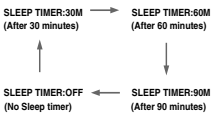


   The Wake Up timer starts immediately after you have set it.

2. Select the program number or video input you want to wake up to.
3. Press I/⏻, or set the Sleep timer if you want the TV to turn off automatically.
   The ◴ indicator on the TV lights up orange when the TV goes into standby mode.

Setting the Sleep timer

Press ◴ until the desired period of time appears on the screen.



The Sleep timer starts immediately after you have set it.

Notes

- You can also cancel the Wake Up and Sleep timers by turning off the TV's main power.
- If no buttons or controls are pressed for more than two hours after the TV is turned on using the Wake Up timer, the TV automatically goes into standby mode.

Presetting channels (continued) (KV-HA21M50/HA21M60/HA21M80/HA21M80/H/HA21M81)

To change the TV system setting

If the picture or sound is abnormal when receiving programs through the ⅂ (antenna input) terminal

(1) Press SELECT until "TV SYS" appears on the screen.
(2) Press + or – to select the appropriate TV system until the picture or sound quality is optimal.
B/G → I → D/K → M

To change the color system setting

If the color is abnormal when receiving programs through the ⅂ (antenna input) terminal or the ⏎ (video input) terminal

(1) Press SELECT until "COLOR SYS" appears on the screen.
(2) Press + or – to select the appropriate color system until the color is optimal.
AUTO → PAL → SECAM → NTSC3.58 → NTSC4.43

To skip program numbers

(1) Press PROGR +/– or the number buttons until the unused or unwanted program number appears on the screen.
(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.
(3) Press + or – once to enter the "MANUAL PROGRAM" mode.
(4) Press PIC MODE to skip the unused or unwanted program number.
(5) Press SELECT to exit the "MANUAL PROGRAM" mode.

Note

- To restore the skipped program number again, preset the channel automatically or manually.

To use the fine tuning function

The fine tuning (FINE) function may help to reduce the following problems: double images and lines moving across the TV screen.

You can use the fine tuning function as below:

(1) Select the program number you want to adjust.
(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.
(3) Press + or – once to enter the "MANUAL PROGRAM" mode.
(4) Press ⓘ to display "FINE" on the screen.
(5) Press + or – continuously until the above problems are minimized.
The + or – icon on the screen flashes while tuning.
(6) Press SELECT to exit the "MANUAL PROGRAM" mode.

Presetting channels (continued) (KV-HA21P52)

To change the color system setting

If the color is abnormal when receiving programs through the ⅂ (antenna input) terminal or the ⇦ (video input) terminal

(1) Press SELECT until "COLOR SYS" appears on the screen.

(2) Press + or – to select the appropriate color system until the color is optimal.

AUTO → PAL → NTSC3.58 → NTSC4.43

To skip program numbers

(1) Press PROGR +/– or the number buttons until the unused or unwanted program number appears on the screen.

(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.

(3) Press + or – once to enter the "MANUAL PROGRAM" mode.

(4) Press PIC MODE to skip the unused or unwanted program number.

(5) Press SELECT to exit the "MANUAL PROGRAM" mode.

Note

- To restore the skipped program number again, preset the channel automatically or manually.

To use the fine tuning function

The fine tuning (FINE) function may help to reduce the following problems: double images and lines moving across the TV screen.

You can use the fine tuning function as below:

(1) Select the program number you want to adjust.

(2) Press SELECT until "MANUAL PROGRAM" appears on the screen.

(3) Press + or – once to enter the "MANUAL PROGRAM" mode.

(4) Press ⇧ to display "FINE" on the screen.

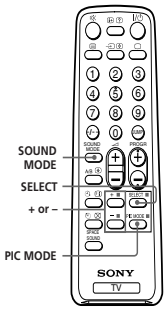
(5) Press + or – continuously until the above problems are minimized. The + or – icon on the screen flashes while tuning.

(6) Press SELECT to exit the "MANUAL PROGRAM" mode.

K Customizing the picture and sound

You can customize the picture and sound by selecting the picture and sound modes or by adjusting its settings.

You can change the sound effect by selecting the space sound mode.



Selecting the picture mode

Press PIC MODE to select the desired picture mode.

Select	To
"DYNAMIC"	view high contrast pictures.
"STANDARD"	view normal contrast pictures.
"SOFT"	view mild pictures.

Selecting the sound mode

Press SOUND MODE to select the desired sound mode.

Select	To
"♪ DYNAMIC"	listen to dynamic and clear sound that emphasizes the low and high sound.
"♪ DRAMA"	listen to sound that emphasizes vocals and background music.
"♪ SOFT"	listen to soft sound.

Adjusting the picture and sound settings

1 Press SELECT until the desired setting appears.

Each time you press SELECT, the setting item will change as follows:

PICTURE → COLOR → BRIGHT → HUE → SHARP → BASS → TREBLE → BALANCE → (back to PICTURE)

2 Press + or – to adjust the item.

3 To adjust other items, repeat steps 1 to 2.

Notes

- "HUE" can be adjusted for the NTSC color system only.
- Reducing "SHARP" can also reduce picture noise.

Customizing the picture and sound (continued)

Selecting the space sound mode

Press SPACE SOUND.

Select	To
"ON"	listen to monaural sound with a stereo-like effect.
"OFF"	turn off space sound mode.

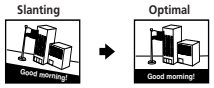
Note

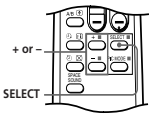
- You can also turn space sound on or off using the SELECT and + or – buttons.

L Adjusting the picture position

▶ KV-HA21M50/HA21M80(E)/HA21M81 only

If the picture is slanting, you can adjust the picture position using the "PIC ROTATION" function until it is optimal.





1 Press SELECT repeatedly until "PIC ROTATION" appears on the screen.

2 Press + or – to adjust the picture position.

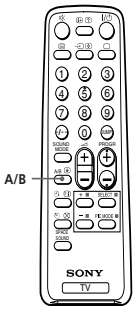
The ⊥ or ⊤ icon on the screen flashes while adjusting.

Note

- To reduce the slanting picture, keep external speakers or other electrical equipment away from the TV.

L Enjoying stereo or bilingual programs (KV-HA21M60 only)

You can enjoy stereo sound or bilingual programs of NICAM and A2 stereo systems by using the A/B button.



When receiving a NICAM program ▶KV-HA21M60 only

Broadcasting	On-screen display (Selected sound)
NICAM stereo	NICAM (Stereo sound) → MONO (Regular sound)
NICAM bilingual	NICAM MAIN (Main sound) → NICAM SUB (Sub sound) → MONO (Regular sound)
NICAM monaural	NICAM MAIN (Main sound) → MONO (Regular sound)

When receiving an A2 program

Broadcasting	On-screen display (Selected sound)
A2 stereo (KV-HA21M60 only)	MONO (Regular sound) → STEREO (Stereo sound)
A2 bilingual	MAIN (Main sound) → SUB (Sub sound)

Notes

- If the sound is distorted when receiving a monaural program through the ⅂ (antenna) terminal, press A/B repeatedly until "MONO" appears on the screen. To cancel the monaural sound setting, press A/B again until "AUTO" appears on the screen.

KV-HA21M60 only

- If the stereo sound is noisy when receiving a stereo program, select "MONO". The sound becomes monaural, but the noise is reduced.

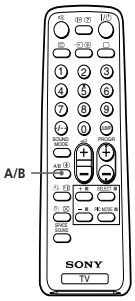
KV-HA21P52/HA14P52 only

- When viewing a non-bilingual program, select the main sound. Otherwise, you may hear some noise or abnormal sound.

L Enjoying bilingual program

(KV-HA21P52 only)

You can enjoy bilingual program of A2 bilingual system by using the A/B button.



When receiving an A2 program

Broadcasting	On-screen display (Selected sound)
A2 bilingual	MAIN (Main sound) → SUB (Sub sound)

Note

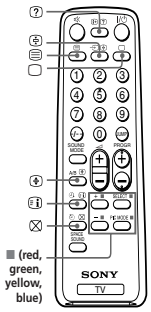
- When viewing a non-bilingual program, select the main sound. Otherwise, you may hear some noise or abnormal sound.

M Viewing Teletext

▶ **KV-HA21M81 only**

Some TV stations broadcast an information service called Teletext which allows you to receive various information, such as stock market reports and news.

You can use the buttons on the remote to view Teletext.



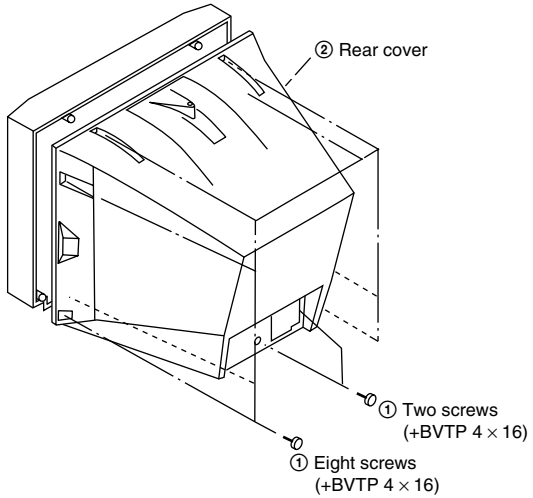
To	Do this
display a Teletext page on the TV picture	Press ▤. Each time you press ▤, the screen changes as follows: Teletext → Teletext and TV → TV. If there is no Teletext broadcast, "100" is displayed at the top left corner of the screen.
check the contents of a Teletext service	Press ⓘ. An overview of the Teletext contents, including page numbers, appears on the screen.
select a Teletext page	Press the number buttons to enter the three-digit page number of the desired Teletext page. If you make a mistake, reenter the correct page number. To access the next or previous page, press PROGR +/–.
hold (pause) a Teletext display	Press ⓢ to display the symbol "ⓢ" at the top left corner of the screen. To resume normal Teletext viewing, press ⓢ or ▤.
reveal concealed information (e.g., an answer to a quiz)	Press ?. To conceal the information, press the button again.
enlarge the Teletext display	Press ⓔ. Each time you press ⓔ, the Teletext display changes as follows: Enlarge upper half → Enlarge lower half → Normal size.
stand by for a Teletext page while watching a TV program	1 Enter the Teletext page number that you want to refer to, then press ⊠. 2 When the page number is displayed, press ▤ to show the text.
select a FASTEXT menu or the colored boxes	Press ■ (red, green, yellow and blue) that corresponds to the desired menu or page number.
turn off Teletext	Press ▢.

Note

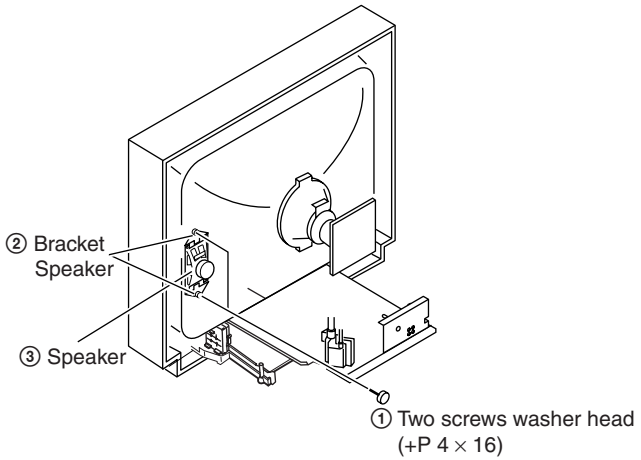
- The FASTEXT feature can be used only when the FASTEXT broadcast is available.

SECTION 2
DISASSEMBLY

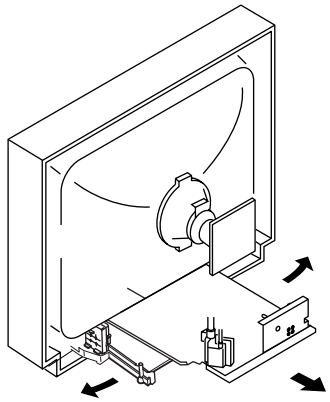
2-1. REAR COVER REMOVAL



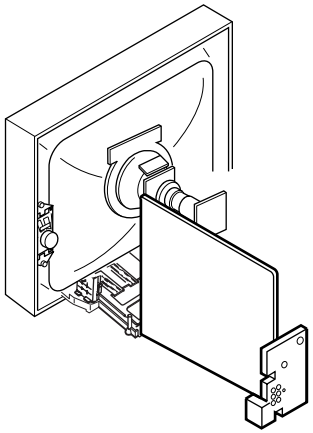
2-2. SPEAKER REMOVAL



2-3. CHASSIS ASSY REMOVAL



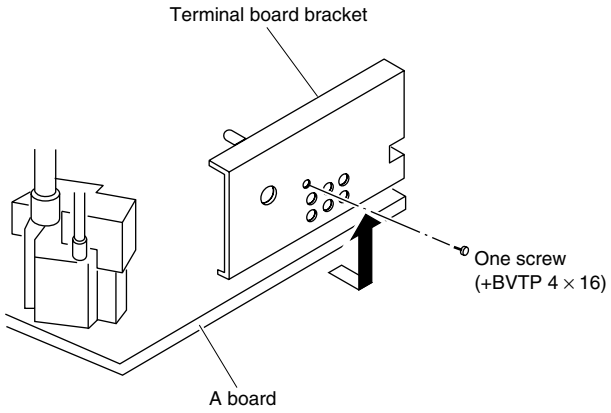
2-4. SERVICE POSITION



Caution: Do not take out CRT support block while TV set in standing position.

Note: Undress necessary wires that creates tension while placing the chassis into Service Position.

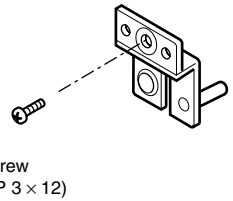
2-5. TERMINAL BRACKET REMOVAL



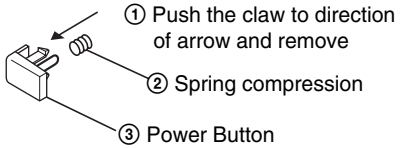
2-6. REPLACEMENT OF PARTS

For replacements of light guide,unscrew them, exchange with new parts and fix them with screws respectively.

2-6-1. Replacement of Light Guide



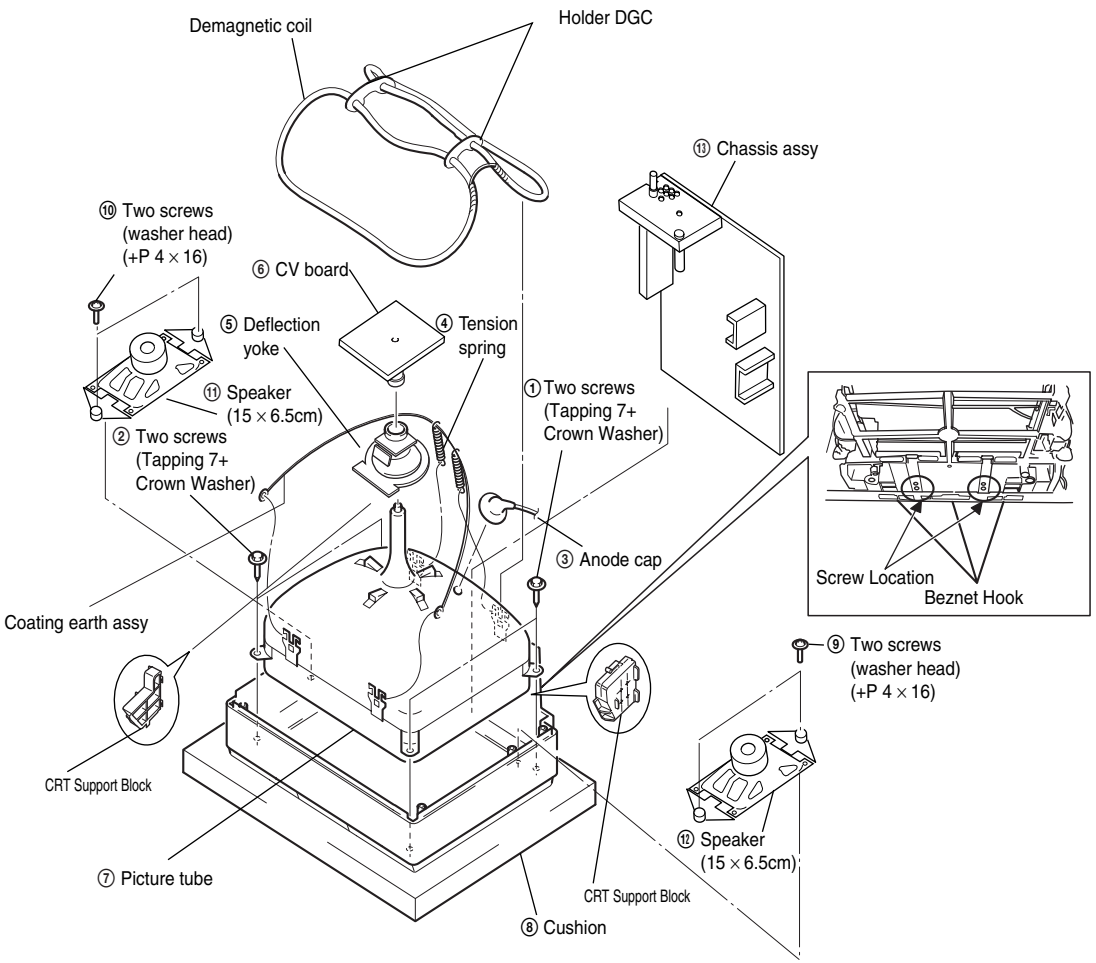
2-6-2. Replacement of Power Button



2-7. PICTURE TUBE REMOVAL

Note:

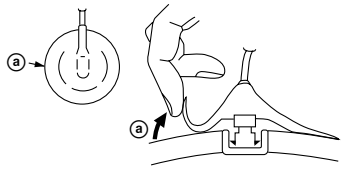
- Please make sure the TV set is not in standing position before removing necessary CRT support located on bottom right and left.



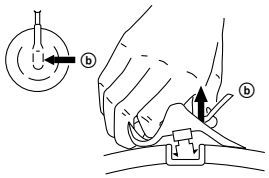
•REMOVAL OF ANODE-CAP

NOTE : After removing the anode, short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT.

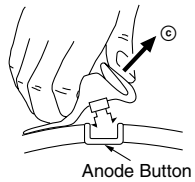
•REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



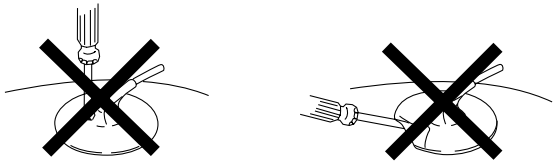
② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ.

- **HOW TO HANDLE AN ANODE-CAP**

① Do not damage the surface of anode-caps with sharp shaped objects.
② Do not press the rubber too hard so as not to damage the inside of anode-cap. A metal fitting called the shatter-hook terminal is built into the rubber.
③ Do not turn the foot of rubber over too hard. The shatter-hook terminal will stick out or damage the rubber.



SECTION 3
SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Controls and switches should be set as follows unless otherwise noted:

PICTURE control ..... normal
BRIGHTNESS control ..... normal

Perform the adjustments in the following order :

1. Beam Landing
2. Convergence
3. Focus
4. White Balance

Note : Test Equipment Required.

1. Pattern Generator
2. Degausser
3. Oscilloscope

Preparation :

In order to reduce the influence of geomagnetism on the set's picture tube, face it east or west.
Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input a white signal with the pattern generator.
   Contrast } normal
   Brightness
2. Set the pattern generator raster signal to a green raster.
3. Move the deflection yoke to the rear and adjust with the purity control so that the green is at the center and the blue and the red take up equally sized areas on each side. (See Figures 3-1 through 3-4.)
4. Move the deflection yoke forward and adjust so that the entire screen is green. (See Figure 3-1.)
5. Switch the raster signal to blue, then to red and verify the condition.
6. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws and DY spacers.
7. If the beam does not land correctly in all the corners, use a magnet to adjust it. (See Figure 3-4.)

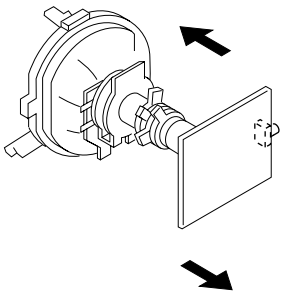


Fig. 3-1

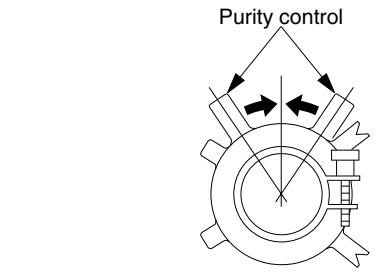


Fig. 3-2

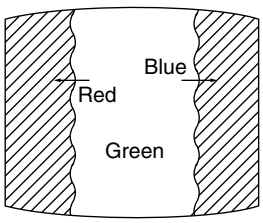


Fig. 3-3

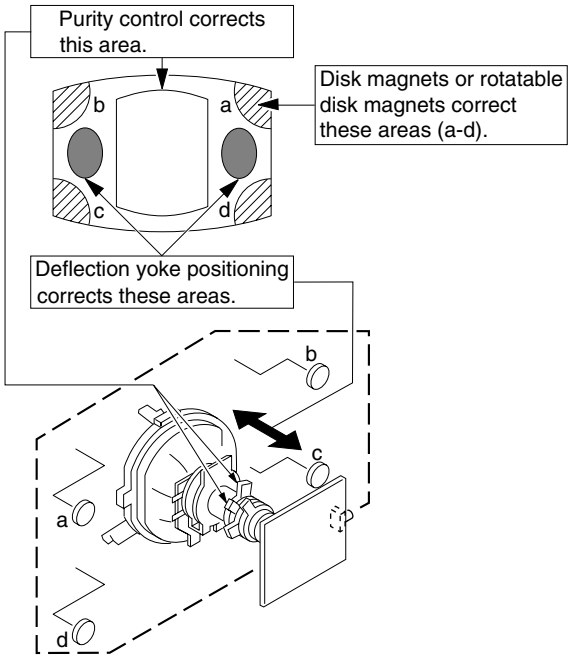


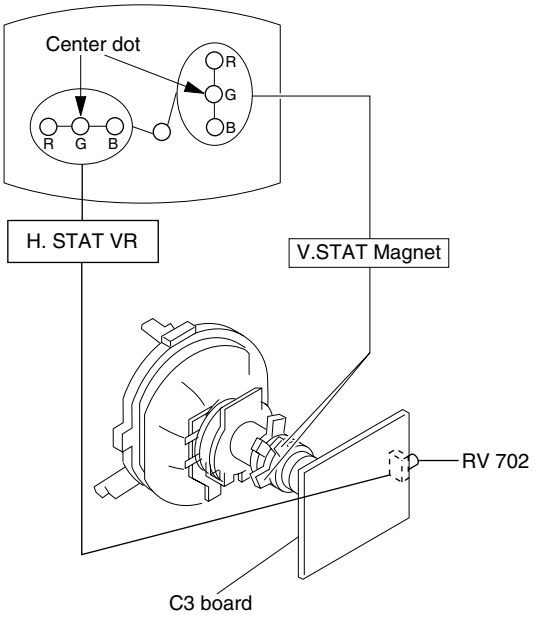
Fig. 3-4

3-2. CONVERGENCE

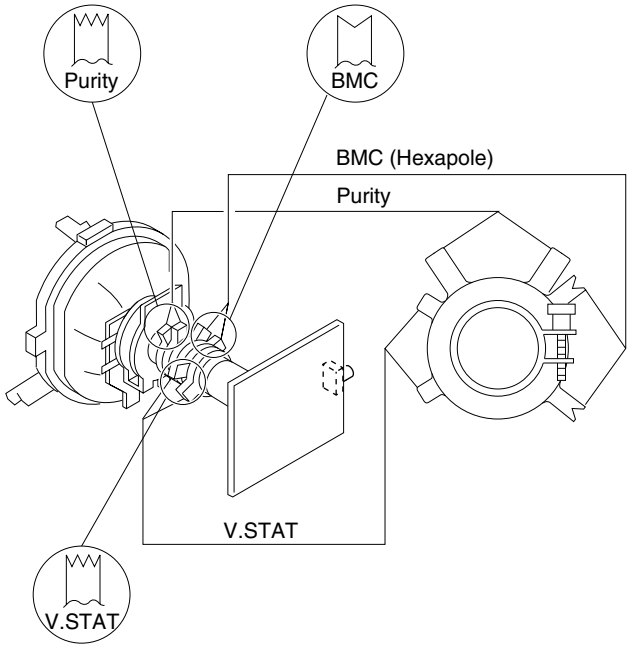
Preparation :

- Before starting this adjustment, adjust the focus, horizontal size and vertical size.
- Receive dot/hatch signal.
- Pic mode: Soft.

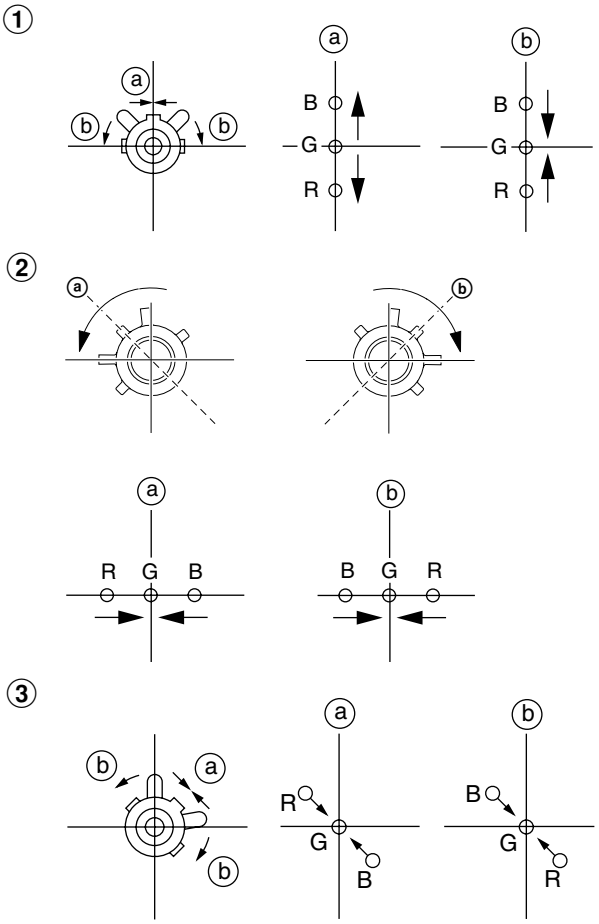
(1) Horizontal and Vertical Static Convergence



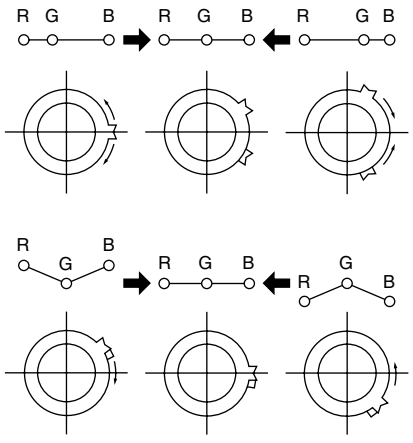
1. (Moving vertically), adjust the V.STAT magnet so that the red, green and blue dots are on top of each other at the center of the screen.
2. (Moving horizontally), adjust the H.STAT VR control so that the red, green and blue dots are on top of each other at the center of the screen.
3. If the H.STAT variable resistor cannot bring the red, green and blue dots together at the center of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V.STAT magnet in the manner given below.
   (In this case, the H.STAT variable resistor and the V.STAT magnet influence each other, so be sure to perform adjustments while tracking.)



- Operation of V. Stat magnet
  If the V. Stat magnet is moved in the "a" and "b" arrows, the red, green and blue dots move as shown below.



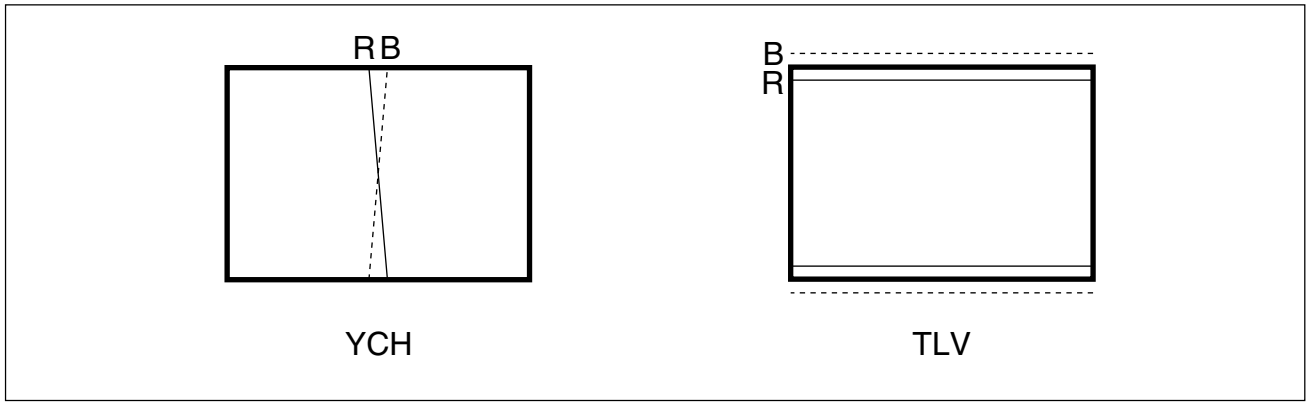
④ BMC (Hexapole) Magnet.
If the red, green and blue dots are not balanced or aligned, then use the BMC magnet to adjust in the manner described below.



(2) Dynamic Convergence Adjustment

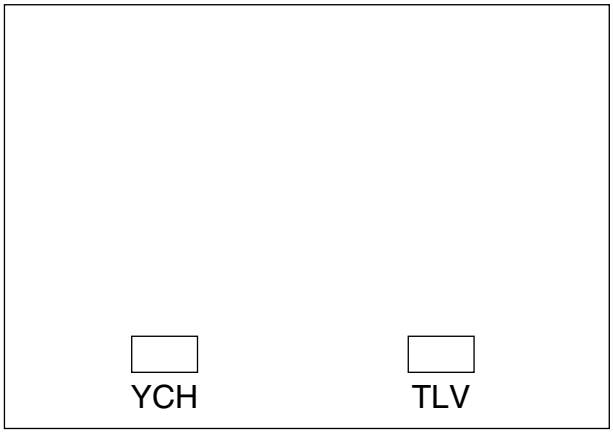
Preparation:

Before starting this adjustment, adjust the horizontal static convergence and the vertical static convergence

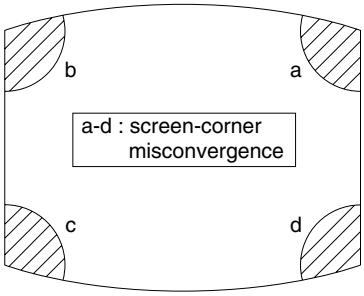


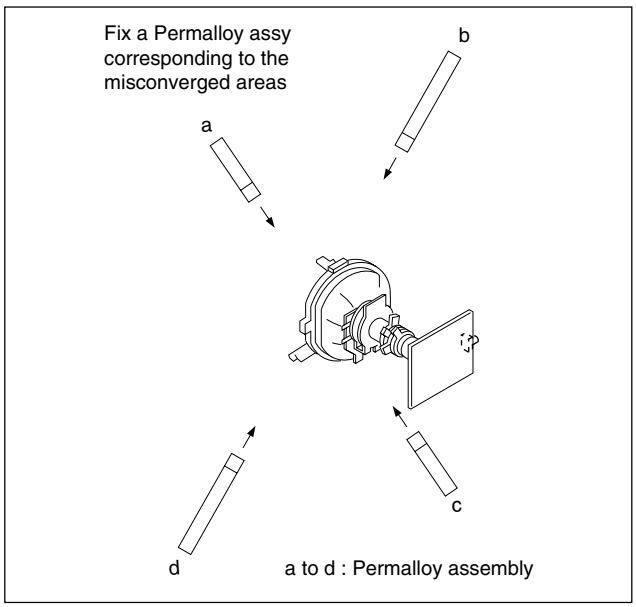
TLH	Insert	TLH	Correction Plate to DY Pocket (Left or Right)
YCH	Rotate	YCH	VOL on DY
TLV	Rotate	TLV	VOL ON DY
XCV	Rotate	XCV	Adj core on DY

ON DY:



(3) Screen-corner Convergence

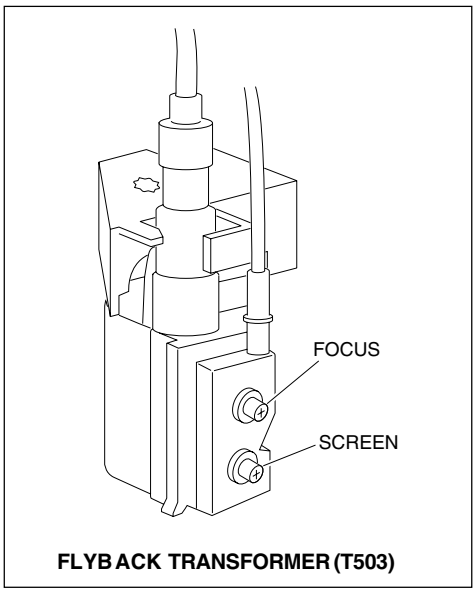




3-3. FOCUS ADJUSTMENT

FOCUS adjustment should be completed before W/B adjustment.

1. Receive digital monoscope pattern.
2. Set "Picture Mode" to "DYNAMIC".
3. Adjust focus VR so that the center of screen becomes just focus.
4. Change the receiving signal to white pattern and blue back.
5. Confirm magenta ring is not noticeable. Incase magenta is very obvious, adjust focus VR to take balance of magenta ring and focus.

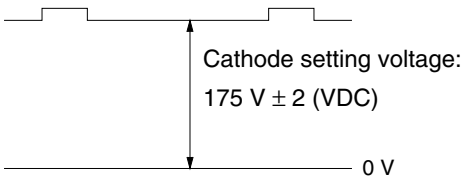


FLYBACK TRANSFORMER (T503)

3-4. G2 (SCREEN) AND WHITE BALANCE ADJUSTMENTS

1. G2 (SCREEN) ADJUSTMENT

1) Set the PICTURE to normal.
2) Put to VIDEO input mode without signals.
3) Connect R, G and B of the C board cathode to the oscilloscope.
4) Adjust BRIGHTNESS to obtain the cathode voltage to the value below.
5) Adjust G2 (screen) on the FBT until picture shows the point before cut off.

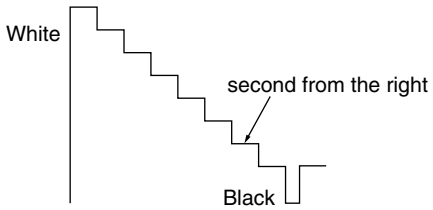


2.a) WHITE BALANCE ADJUSTMENT

1) Set to Service Mode (Refer Section 4-1: ADJUSTMENTS WITH COMMANDER).
2) Input white raster signal.
3) Set 49 (ABL) and IF (VP2) service mode to 00.
4) Set Picture to DYNAMIC.
5) Select OB (RDR) with [1] and [4], and set the level to 25 with [3] and [6] for best white balance.
6) Select OC 'GDR' and OD 'BDR' with [1] and [4], and adjust the level with [3] and [6] for the best white balance.
7) Write into the memory by pressing [MUTING] then [0].
8) Set back 49 'ABL' and IF 'VP2' service mode to original data.

2.b) SUB BRIGHT ADJUSTMENT

1) Set to service mode.
2) Set 49(ABL) and IF (VP2) service mode to 00
3) Input a staircase signal of black to white from the pattern generator.
4) BRIGHTNESS .... 50%.
   PICTURE ..... MINIMUM
5) Select OE 'SBR' with [1] and [4], and adjust OE 'SBR' level with [3] and [6] so that the second stripe from the right is dimly lit.
6) Write into the memory by pressing [MUTING] then [0].
7) Set back 49 (ABL) and IF (VP2) service mode to original data.



SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ADJUSTMENT WITH COMMANDER

Service adjustments to this model can be performed using the supplied Remote Commander RM-969

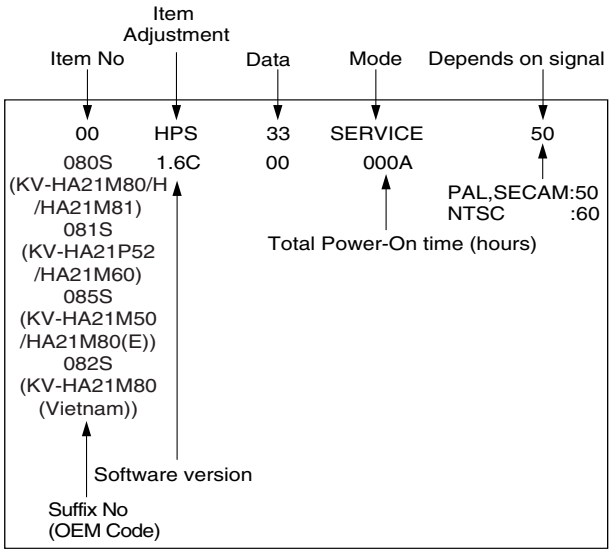
a. ENTERING SERVICE MODE

With the unit on standby

→ [DISPLAY] → [5] → [VOL (+)] → [POWER]

This operation sequence puts the unit into service mode.

The screen display is :



b. METHOD OF CANCELLATION FROM SERVICE MODE

Set the standby condition (Press [POWER] button on the commander), then press [POWER] button again, hereupon it becomes TV mode.

c. METHOD OF WRITE INTO MEMORY

1) Set to Service Mode.
2) Press [1] (UP) and [4] (DOWN), to select the adjustment.
4) Press [MUTING] button to indicate WRITE on the screen.
5) Press [0] button to write into memory.

d. MEMORY WRITE CONFIRMATION METHOD

1) After adjustment, pull out the plug from AC outlet, and then plug into AC outlet again.
2) Turn the power switch ON and set to Service Mode.
3) Call the adjusted items again to confirm adjustments were made.

[1], [4]	Select the adjustment item.
↓	
[3], [6]	Raise/lower the data value.
↓	
[MUTING]	Writes.
↓	
[0]	Executes the writing.

e. OTHER FUNCTION VIA REMOTE COMMANDER

[7], [0]	All the data becomes the values in memory.
[8], [0]	All user control goes to the standard state.
[5], [0]	Service data initialization (Be sure not to use usually.)
[2], [0]	Copy and write all data.
[MUTE], [0]	Write 50Hz adjustment data to 60Hz or vice versa.

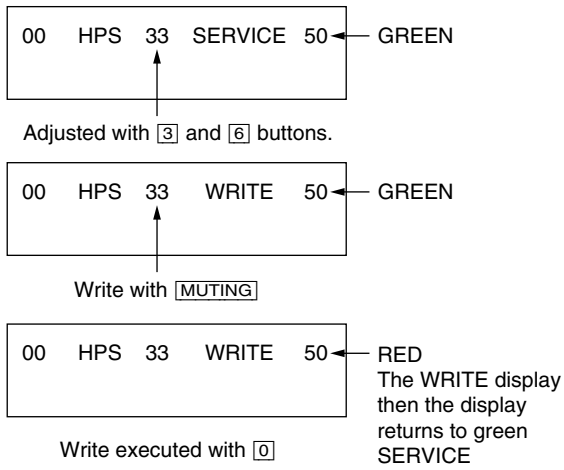
4-2. ADJUSTMENT METHOD

Item Number 00 HPS

This explanation uses H Shift as an example.

1. Select “00 HPS” with the [1] and [4] buttons.
2. Raise/lower the data with the [3] and [6] buttons.
3. Select the optimum state. (The standard is 1F for PAL reception.)
4. Write with the [MUTING] button. (The display changes to WRITE.)
5. Execute the writing with the [0] button. (The WRITE display will be changed to red color while excuting, and back to SERVICE.)

Example on screen display :-



Use the same method for all Items. Use [1] and [4] to select the adjustment item, use [3] and [6] to adjust, write with [MUTING], then execute the write with [0].

Note : 1. In [WRITE], the data for all items are written into memory together.
2. For adjustment items that have different standard data between 50Hz or 60Hz, be sure to use the respective input signal after adjustment.

Adjustment Item Table

Functionality		Init.	Range	Function	Table & Note	Device Name (Slave Address)												
No.	Name						Common	50	60	SECAM	NTSC	PAL	TV	Video	Teletext	M System	Non-M System	Dynamic	Others
00	HPS	2A	3F	H Position	50/60Hz	TDA8843/44(8A)		2A	2A										
01	HSZ	1F	3F	H Size	50/60Hz			1F	1F										
02	PAP	1F	3F	Pin Amplitude	50/60Hz			1F	1F										
03	CPN	1F	3F	Corner Pin	50/60Hz			1F	1F										
04	TLT	1F	3F	Tilt	50/60Hz			1F	1F										
05	VSL	26	3F	V Slope	50/60Hz			**26**	**26**										
06	VAP	0F	3F	V Amplitude	50/60Hz			0F	0F										
07	SCO	0F	3F	S Correction	50/60Hz			0F	0F										
08	VPS	1F	3F	V Shift	50/60Hz			1F	1F										
09	VZM	19	3F	Vertical Zoom			**19**												
0A	VSC	1F	3F	Vertical Scroll	50/60Hz			**1F**	**1F**										
0B	RDR	1F	3F	R Drive	Dynamic/Others													**1F**	**24**
0C	GDR	25	3F	G Drive	Dynamic/Others													25	25
0D	BDR	25	3F	B Drive	Dynamic/Others													25	20
0E	SBR	58	7F	Sub Brightness			58												
0F	PMX	20	3F	Picture Maximum Data	TV/Video/Teletext								20	20	20				
10	PMI	04	3F	Picture Maximum Data			**04**												
11	SHU	07	0F	Sub Hue	TV/Video								07	09					
12	SSH	01	03	Sub Sharpness	TV/Video								**01**	**03**					
13	SC1	20	3F	Sub Color Lower	50/60Hz			20	1C										
14	SC2	08	3F	Sub Color Higher	50/60Hz			**08**	**0B**										
15	FO	00	03	01 Time Constant	TV/Video/Teletext								**00**	**00**	**00**				
16	AGT	00	3F	AGC Take Over	TV/Video/Teletext								00	00	00				
17	VSW	01	01	Video Mute Switch	TV/Video/Teletext								**00**	**01**	**00**				
18	FOR	03	03	Forced Field Frequency			**03**												
19	DL	00	01	De-interlace			**00**												
1A	POC	00	01	Fixed 01 Synchro. Mode			**00**												
1B	COR	01	01	Noise Coring	TV/Video/Teletext								**01**	**00**	**00**				
1C	RBL	00	01	RGB Blanking	TV/Video/Teletext								**00**	**00**	**00**				
1D	YDL	0A	0F	Y-Delay	PAL/NTSC/SECAM					**06**	**0C**	**0A**							
1E	VP1	00	FF	Extra Bits (see specified pages)			**00**												
1F	VP2	01	FF	Extra Bits (see specified pages)			**01**												
20	VP3	0F	FF	Extra Bits (see specified pages)			**0F**												
21	WST	15	FF	W/G Stereo Threshold		MSP3417G(80)	**15**												
22	WBT	EC	FF	W/G Bilingual Threshold			**EC**												
23	WLL	05	FF	W/G Monaural Threshold			**05**												
24	WAC	01	0F	W/G Agreement Threshold			**01**												
25	WDL	30	FF	W/G Search Delay			**30**												

Adjustment Item Table

Functionality		Init.	Range	Function	Table & Note	Device Name (Slave Address)												
No.	Name						Common	50	60	SECAM	NTSC	PAL	TV	Video	Teletext	M System	Non-M System	Dynamic	Others
26	NDL	20	FF	NICAM Search Delay			**20**												
27	SDL	10	FF	Stereo Status Read Delay			**10**												
28	AGC	01	01	AGC Switch auto/constant			**01**												
29	REL	28	3F	AGC Gain at Constant Mode			**28**												
2A	CRM	00	01	Carrier Muting on/off			**00**												
2B	ACO	01	01	Audio Clock-out on/off			**01**												
2C	FP	1B	7F	FM Prescale for B/G, I, D/K			**1B**												
2D	FPM	32	7F	FM Prescale for M			**32**												
2E	FH	36	7F	FM Prescale for HDEV (non-M)			**36**												
2F	FHM	65	7F	FM Prescale for HDEV (M)			**65**												
30	WGP	1C	7F	W/G Prescale			**1C**												
31	NIP	7F	7F	NICAM Prescale			**7F**												
32	ERR	50	FF	Auto FM Switch Threshold			**50**												
33	VOL	6D	7F	DFP Volume Maximum			**6D**												
34	ING	00	0F	Input Gain	M System/non-M/Video	TDA7438(88)								00		00	00		
35	VOM	00	3F	Volume Output Gain	M System only		00												
36	BCS	01	03	Bass Center Shift			**01**												
37	TCS	02	03	Treble Center Shift			**02**												
38	TXH	2A	FF	Horizontal Display Position		SAA5264(58)	**2A**												
39	TXV	27	3F	Vertical Display Position (line offset from V-sync)			**27**												
3A	THD	00	7F	H-sync Active Edge Shift			**00**												
3B	TVD	3F	7F	V-sync Active Edge Shift			**3F**												
3C	HPL	01	01	H-sync Polarity Configuration	00 : Positive, 01 : Negative		**01**												
3D	VPL	01	01	V-sync Polarity Configuration	00 : Positive, 01 : Negative		**01**												
3E	FPL	01	01	Field Polarity Configuration	00 : V-sync second half line, 01 : V-sync first half line		**01**												
3F	FMD	00	00	Force Mode	00 : Auto, 01 : Default, 02 : Fastext, 03 : Top Mode		**00**												
40	TBR	08	0F	Set Teletext RGB Brightness			**08**												
41	NOP	01	0F	National Option Table Configuration			**01**												
42	TCH	01	03	Twisted Character Set Configuration			**01**												
43	BKP	00	3F	Picture Data at Blanking OFF		Other Control	**00**												
44	ODL	10	FF	Power ON Delay			**10**												
45	OSH	0A	3F	OSD H Position			0A												
46	TSY	00	03	TV System at Auto Preset	00 : B/G, 01 : I, 02 : D/K, 03 : M		**00**												
47	DKS	01	01	D/K Stereo enable/disable			**01**												
48	MUT	00	01	Muting on/off at No Sync			**00**												
49	ABL	01	01	Bright ABL Switch			**01**												
4A	SCM	01	01	SECAM Trap active/inactive			**01**												
4B	SLS	01	01	Activate SL.OR.IFI Sync			**01**												
4C	SSV	02	07	Space Sound Volume Step Up			**02**												
4D	VPW	35	7F	Timer of Video Processor start up wait			**35**												
4E	OP1	2F	FF	Optional Flags 0 (see specified pages)			28												
4F	OP2	0F	FF	Optional Flags 1 (see specified pages)			9D												
50	OP3	00	FF	Optional Flags 2 (see specified pages)			A0												

NOTE

- Standard data listed on the Adjustment Item Table are reference values, therefore it may be different for each model and for each mode.
- Note for Different Data Those are the standard data values written on the microprocessor. Therefore, the data values of the modes and stored respectively in the memory.
  In case of a device replacement, adjustment by rewriting the data value is necessary for some items.

ITEM INFORMATION

No. 1E VP1

Item	-	-	BCO	OSO	SBL	HBL	FCO	FFI
KV-HA21M50	0	0	0	0	0	0	0	0
KV-HA21M60	0	0	0	0	0	0	0	0
KV-HA21M80 (E)	0	0	0	0	0	0	0	0
KV-HA21M80 (VT)	0	0	0	0	0	0	0	0
KV-HA21M80/H	0	0	0	0	0	0	0	0
KV-HA21M81	0	0	0	0	0	0	0	0
KV-HA21P52	0	0	0	0	0	0	0	0

BCO	Switch-on behaviour 1=Switch -on of picture via internal delay 0=Without delay	00(4)
OSO	1=Switch off in vertical overscan 0=Switch-off undefind	18(7)
SBL	Service blanking 1= on 0= off	0B(7)
HBL	RGB Blanking Mode 1 = wide blanking, 0 = normal blanking	02(7)
FCO	Forced Color-on 1=no colour killer 0=normal colour killer function	1B(0)
FFI	Fast filler IF-PLL 1=increased time constant 0=normal time constant	1A(1)

No. 1F VP2

Item	-	-	MAT	DS	DSA	EBS	BLS	BKS
KV-HA21M50	0	0	0	0	0	0	0	1
KV-HA21M60	0	0	0	0	0	0	0	1
KV-HA21M80 (E)	0	0	0	0	0	0	0	1
KV-HA21M80 (VT)	0	0	0	0	0	0	0	1
KV-HA21M80/H	0	0	0	0	0	0	0	1
KV-HA21M81	0	0	0	0	0	0	0	1
KV-HA21P52	0	0	0	0	0	0	0	1

MAT	PAL-SECAM-/NTSC Matrix 1 =PAL matrix, 0=adapted to standard	0E(7)
DS	Dynamic skin control on/off 1= on 0= off	1A(3)
DSA	Dynamic skin control angle 1=correction angle 117 degrees 0=correction angle 123 degrees	1A(2)
EBS	Extended Blue Stretch 1= on 0= off	1A(0)
BLS	Blue stretch 1= on 0= off	18(4)
BKS	Black stretch 1= on 0= off	18(3)

No. 20 VP3

Item	BB	AKB	BPS	CB	ACL	CL2	CL1	CL0
KV-HA21M50	0	0	0	0	1	0	0	0
KV-HA21M60	0	0	0	0	1	0	0	0
KV-HA21M80 (E)	0	0	0	0	1	0	0	0
KV-HA21M80 (VT)	0	0	0	0	1	0	0	0
KV-HA21M80/H	0	0	0	0	1	0	0	0
KV-HA21M81	0	0	0	0	1	0	0	0
KV-HA21P52	0	0	0	0	1	0	0	0

BB	Blue back when no video signal is identified 1= on 0= off	18(0)
AKB	Black current stabilisation 1=not active 0=active	02(6)
BPS	Bypass of chroma base-band delay line 1=bypassed 0=active	19(6)
CB	Chroma bandpass centre frequency 1= 1.1x Fsc 0=Fsc	18(5)
ACL	Automatic colour limiting 1= active 0= not active	19(5)

CL2	CL1	CL0	Cathode Drive amplitude
0	0	0	57V
0	0	1	63V
0	1	0	70V
0	1	1	77V
1	0	0	84V
1	0	1	91V
1	1	0	99V
1	1	1	107V

No. 4E OP1

Item	HA ME VOL	AV Input		COMB	B/G	I	D/K	M
KV-HA21M50	0	0	10	0	1	1	1	1
KV-HA21M60	0	0	10	0	1	1	1	1
KV-HA21M80 (E)	0	0	10	0	1	1	1	1
KV-HA21M80 (VT)	0	0	10	0	1	1	1	1
KV-HA21M80/H	0	0	10	0	1	1	1	1
KV-HA21M81	0	0	10	0	1	1	1	1
KV-HA21P52	0	0	10	0	1	0	0	0

HA ME Vol — Tone controller Volume curve setting. 1 = for HA(ME), 0 = for HA(GE)

AV Input — 00 = no AV Input model; 01 = 1 AV Input model; 10 = 2 AV Input model; 11 = Not available

COMB (for NTSC model) — 1 = Enable external comb filter, 0 =Disable external comb filter

Other optional function will be enabled if the corresponding bit is set to 1.

No. 4F OP2

Item	No NICAM	US ST	HDEV	I V-Curve	XTAL SEL		SECAM	2nd Lang.
KV-HA21M50	0	0	0	0	11	11	1	1
KV-HA21M60	0	0	1	0	11	11	1	1
KV-HA21M80 (E)	0	0	0	0	11	11	1	1
KV-HA21M80 (VT)	0	0	0	0	11	11	1	1
KV-HA21M80/H	0	0	0	0	11	11	1	1
KV-HA21M81	0	0	0	0	11	11	0	1
KV-HA21P52	1	0	0	0	11	11	0	1

No NICAM — 1 = NICAM search is disable in any TV system, 0 = NICAM search operates

US ST — (Reserved for NTSC model)

1 V-Curve (for monaural model) — 1 = using common volume curve for every mode and every TV system; 0 = another volume curve available for video mode and M system

XTAL SEL — 00 = only 4.43 XTAL; 01 = only 3.58 XTAL; 10 = not used; 11 = both 4.43 and 3.58 XTAL

Other optional function will be enabled if the corresponding bit is set to 1.

No. 50 OP3

Item	Pict Rot.	Auto TV Sys.	No Bal.	SPC SOUND	Korean ST	VM	H.K. Bil.	Thai Bil.
KV-HA21M50	1	0	0	1	0	0	0	0
KV-HA21M60	0	1	0	1	0	0	0	0
KV-HA21M80 (E)	1	0	0	1	0	0	0	0
KV-HA21M80 (VT)	0	0	0	1	0	0	0	0
KV-HA21M80/H	0	0	0	1	0	0	0	0
KV-HA21M81	1	0	0	1	0	0	0	0
KV-HA21P52	0	0	1	1	0	0	0	1

No Bal. (for AV stereo model) — 1 = no balance in analog select items, 0 = balance included

SPC SOUND — 1 = Space Sound available, 0 = not available

Korean ST — (Reserved for NTSC model)

H.K. Bil. (for monaural model) — 1 = NICAM bilingual available (No NICAM stereo), 0 = not available

Other optional function will be enable if the corresponding bit is set to 1.

OPERATION GUIDE

SERVICE MODE

How to set up new NVM (or initialize already written one)
(1) AC ON
(2) Enter Service Mode - describing below how to enter
(3) Push the commander button “5” and “0” sequentially (only set initial data into RAM, but not write them into NVM yet)
(4) Push the commander button “2” and “0” sequentially (copy the data into all NVM area - all wide modes and 50/60Hz respectively)
(5) Push the commander button “8” and “0” sequentially (initialize user data, select program 1 and exit Service Mode)
(6) Select TV system and execute Auto Preset

How to enter Service Mode
- At power ON, push the commander button “test” and “TV ON” sequentially
- At stand-by, push the commander button “display”, “5”, “vol +” and “power” sequentially

How to exit Service Mode
- Push the commander button “other ON” or power (AC) OFF

How to increment/decrement items and data
- Items : push the commander button “1” / “4”
- Data : push the commander button “3” / “6” (not write into NVM)

Other operations
- Write data into NVM - push the commander button “mute” and “0” sequentially
- Read data from NVM - push the commander button “7” and “0” sequentially
- Copy 50Hz data into 60Hz area - push the commander button “display” and “0” sequentially

SELF DIAGNOSIS MODE

How to enter Self Diagnosis Mode
- At stand-by, push the commander button “display”, “5”, “vol-” and “power” sequentially

How to exit Self Diagnosis Mode
- Push the commander button “other ON” or power (AC) OFF

Other operations
- Clear data and Write into NVM - push the commander button “8” and “0” sequentially

HOTEL TV MODE

How to enter Hotel TV Mode ON stage
- At stand-by, push the commander button “display”, “MUTE”, “vol +” and “power” sequentially
- The Hotel TV setup display, where the maximum level of the volume can be applied (=35 or above)
- Write data into NVM - push the commander button “mute” and “0” sequentially

How to enter Hotel TV Mode OFF stage
- At stand-by, push the commander button “display”, “MUTE”, “vol -” and “power” sequentially
- Write data into NVM - push the commander button “mute” and “0” sequentially

Modification Note

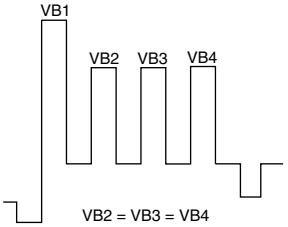
The item including the new addition is yellow.

1. The flag was added to bit 7 of OP1. This is the flag which chooses the volume curve used by HA (ME) model. (V2. IC).

4-3. PICTURE QUALITY ADJUSTMENT

SUB COLOR ADJUSTMENT

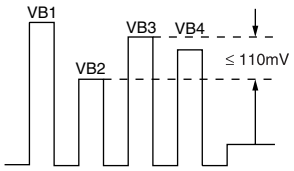
1. Select Video.
2. Input a PAL color-bar.
3. Set to the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN300, A board.
5. Set to Service Mode and select 13 'SC1' with [1] and [4] of the commander then adjust to VB2=VB3=VB4 with [3] and [6].
6. Press [MUTING] → [0] of the commander to write the data.
7. Adjust 13 'SC1' as step 2 to 5 when receiving NTSC color-bar.



VB2 = VB3 = VB4 (Difference is within 70mV)

SUB HUE ADJUSTMENT

1. Select Video.
2. Input a NTSC 3.58, color-bar into Video/TV mode.
3. Set the following condition:
   PICTURE 100%, BRIGHTNESS 50%, COLOR 50%
4. Connect an oscilloscope to pin ① (B OUT) of CN300, A board.
5. Select 11"SHU" with [1] and [4] of the commander by setting to Service Mode and adjust to VB1=VB2=VB3=VB4 with [3] and [6] .



VB1 = VB2 = VB3 = VB4

The highest level of VB1,VB2,VB3,VB4 must be aligned at the same line. Ideal difference level between VB2 and VB3 should be within ± 110mV.

6. Press [MUTING] → [0] of the commander to write the data.
7. Select TV channel with NTSC 3.58 and repeat 3 to 5.
8. Press [MUTING] → [0] of the commander to write the data.
9. Single system model with NTSC 4.43, select TV channel with NTSC 4.43 and repeat 3 to 5.

4-4. DEFLECTION ADJUSTMENT

NORMAL MODE (50Hz)

1. Set to Service mode.
2. Input PAL color bar.
3. Using the [1] and [4] button, select category GEO (Service Mode).
4. Raise/lower the data using the [3] and [6] buttons.
   Select and adjust the following items to obtain optimum image.

Service Item

GEO :	00	HPS	H POSITION
	01	HSZ	H SIZE
	02	PAP	PIN AMPLITUDE
	03	CPN	CORNER PIN
	04	TLT	TILT
	05	VSL	V SLOPE
	06	VAP	VERTICAL AMPLITUDE
	07	SCO	S CORRECTION
	08	VPS	V SHIFT

NORMAL MODE (60Hz)

5. Input 525/60Hz signal.
6. Using the [1] and [4] buttons select category GEO (Service Mode).
7. Select and adjust the following items to obtain obtimum image.
   Raise/lower the data with the [3] and [6] buttons.

Service Item

GEO :	00	HPS	H POSITION
	01	HSZ	H SIZE
	02	PAP	PIN AMPLITUDE
	03	CPN	CORNER PIN
	04	TLT	TILT
	05	VSL	V SLOPE
	06	VAP	VERTICAL AMPLITUDE
	07	SCO	S CORRECTION
	08	VPS	V SHIFT

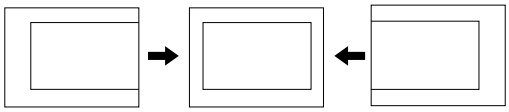
4-5. A BOARD ADJUSTMENT AFTER IC003 (MEMORY) REPLACEMENT

1. Enter to Service Mode.
2. Press commander buttons [5] and [0] (Data Initialize), and [2] and [0] (Data Copy) to initialize the data.
3. Call each item number and check if the respective screen shows the normal picture.
   In cases where items are not well adjusted, rectify the fine adjustment.
   Write the data per each item number ([MUTING] +[0]).
4. Select item numbers 4E 'OP0', 4F 'OP1', 50 'OP2' and respectively set the bit per model with command buttons [3] and [6] .
5. Press commander buttons [8] and [0] (Test Normal) to return to the data that was set on the shipment from the factory. (This will also cancel Service Mode.)

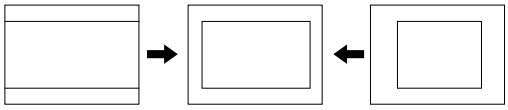
4-6. PICTURE DISTORTION ADJUSTMENT

Item Number 00 – 08

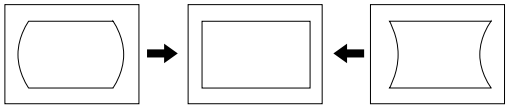
00 HPS (H POSITION)



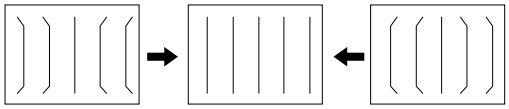
01 HSZ (H SIZE)



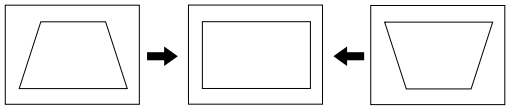
02 PAP (PIN AMPLITUDE)



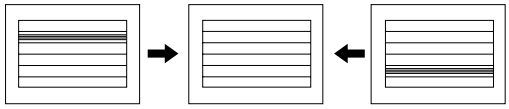
03 CPN (CORNER PIN)



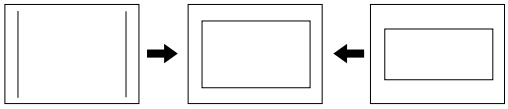
04 TLT (TILT)



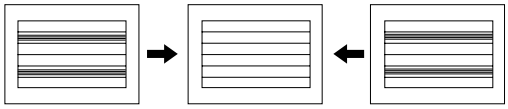
05 VSL (V SLOPE)



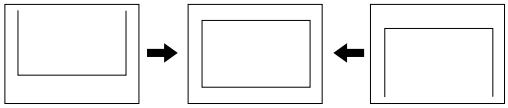
06 VAP (VERTICAL AMPLITUDE)



07 SCO (S CORRECTION)



08 VPS (V SHIFT)



KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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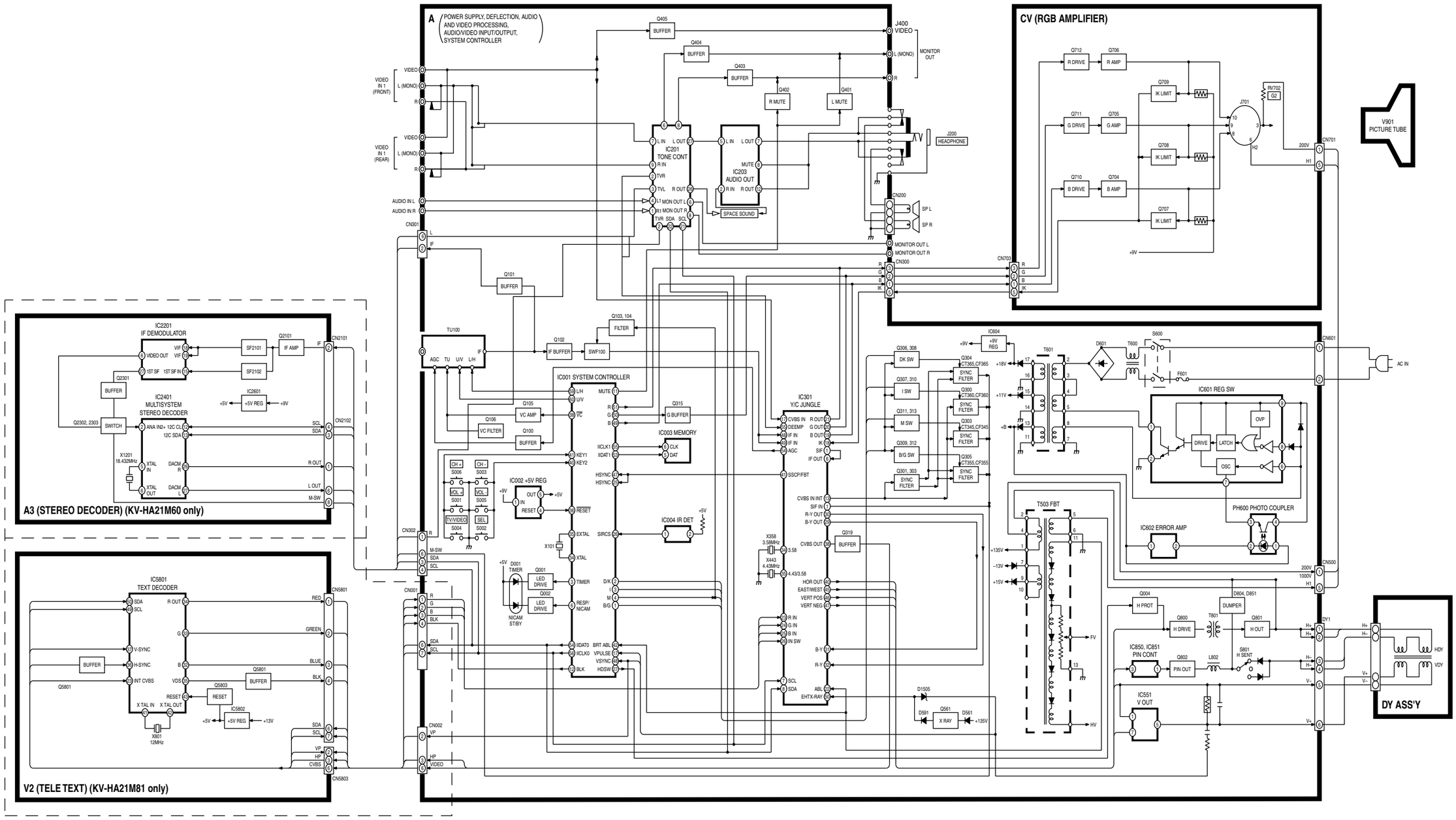
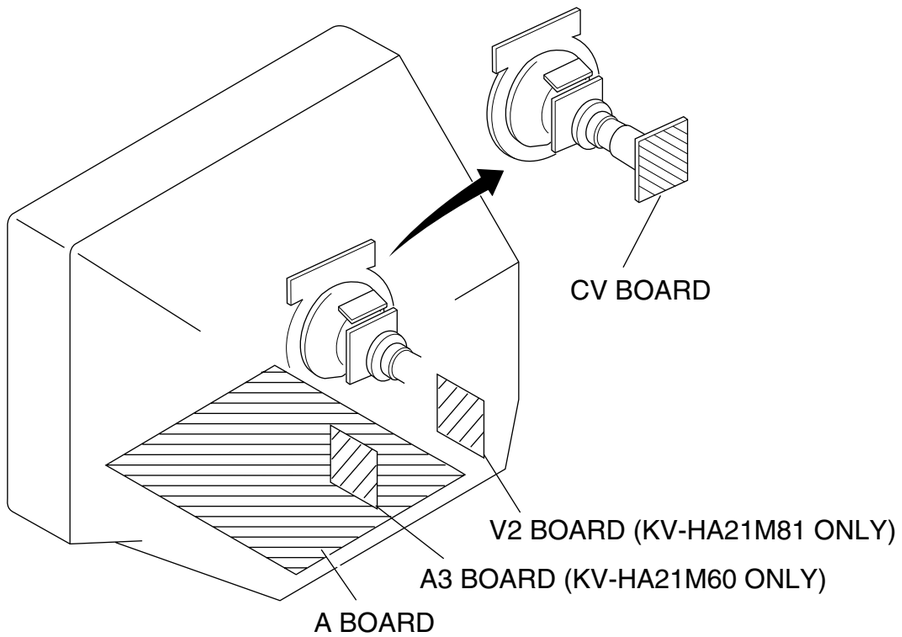
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM



5-2. CIRCUIT BOARDS LOCATION



KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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5-3. SCHEMATIC DIAGRAM

Note:

- All capacitors are in µF unless otherwise noted.
- All electrolytic capacitors are rated at 50V unless otherwise noted.
- All resistors are in ohms.
  kΩ = 1000Ω, MΩ = 1000kΩ
- Indication of resistance which does not have rating electrical power is as follows.

  Pitch: 5 mm
  Rating electrical power 1/4W (CHIP: 1/10W)

- : nonflammable resistor.
- △ : internal component.
- ▭ : panel designation or adjustment for rrepair.
- All variable and adjustable resistors have characteristic curve B unless otherwise noted.
- **Redings are taken with a color-bar signal input.**
  no mark : COMMON
  ( ) : PAL
  [ ] : NTSC 3.58
- **Readings are taken with a 10 MΩ digital multimeter.**
- **Voltage are dc with respect to ground unless otherwise noted.**
- **Voltage variations may be noted due to normal production tolerances.**
- **All voltage are in Volt.**
- **✻ : Cannot be measured.**
- **Circled numbers are waveform references.**
- **: B +bus.**
- **: B –bus.**
- **⇨ : signal path.**

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	: ✻	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

Note: The component identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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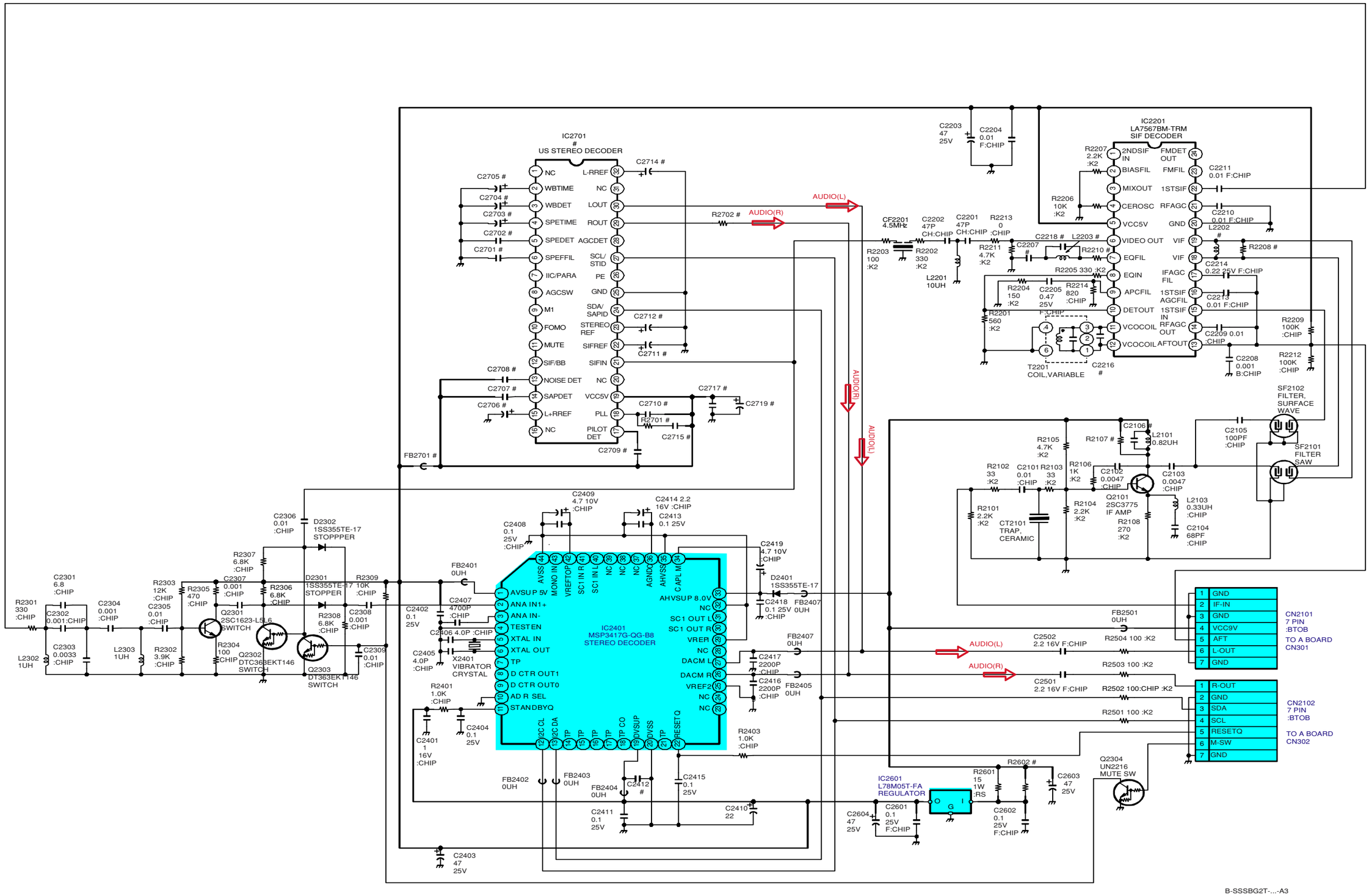
(1) A3 Board Schematic Diagram

(KV-HA21M60 ONLY)

⚠A3 (STEREO DECODER)



KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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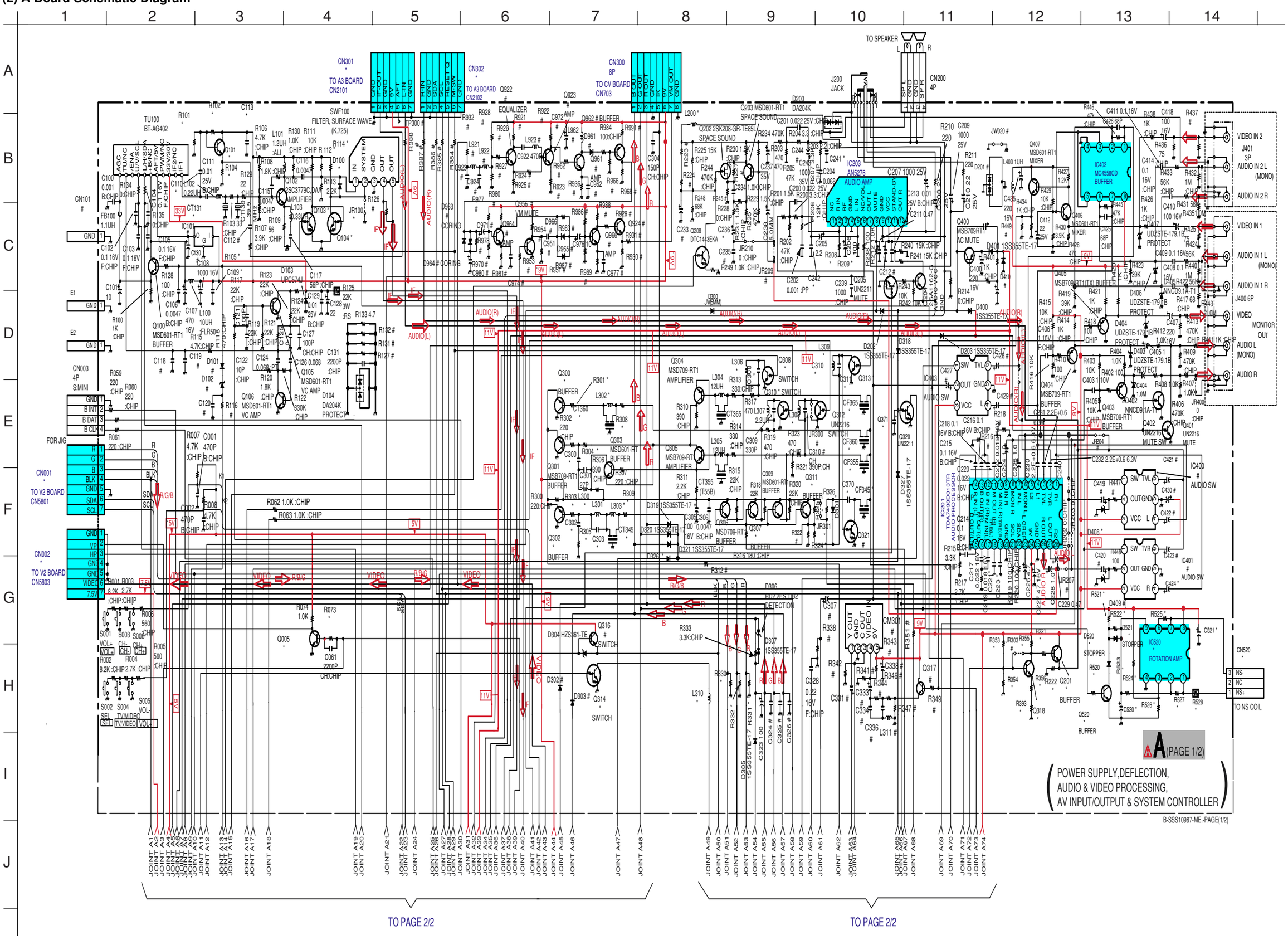
(2) A Board Schematic Diagram



KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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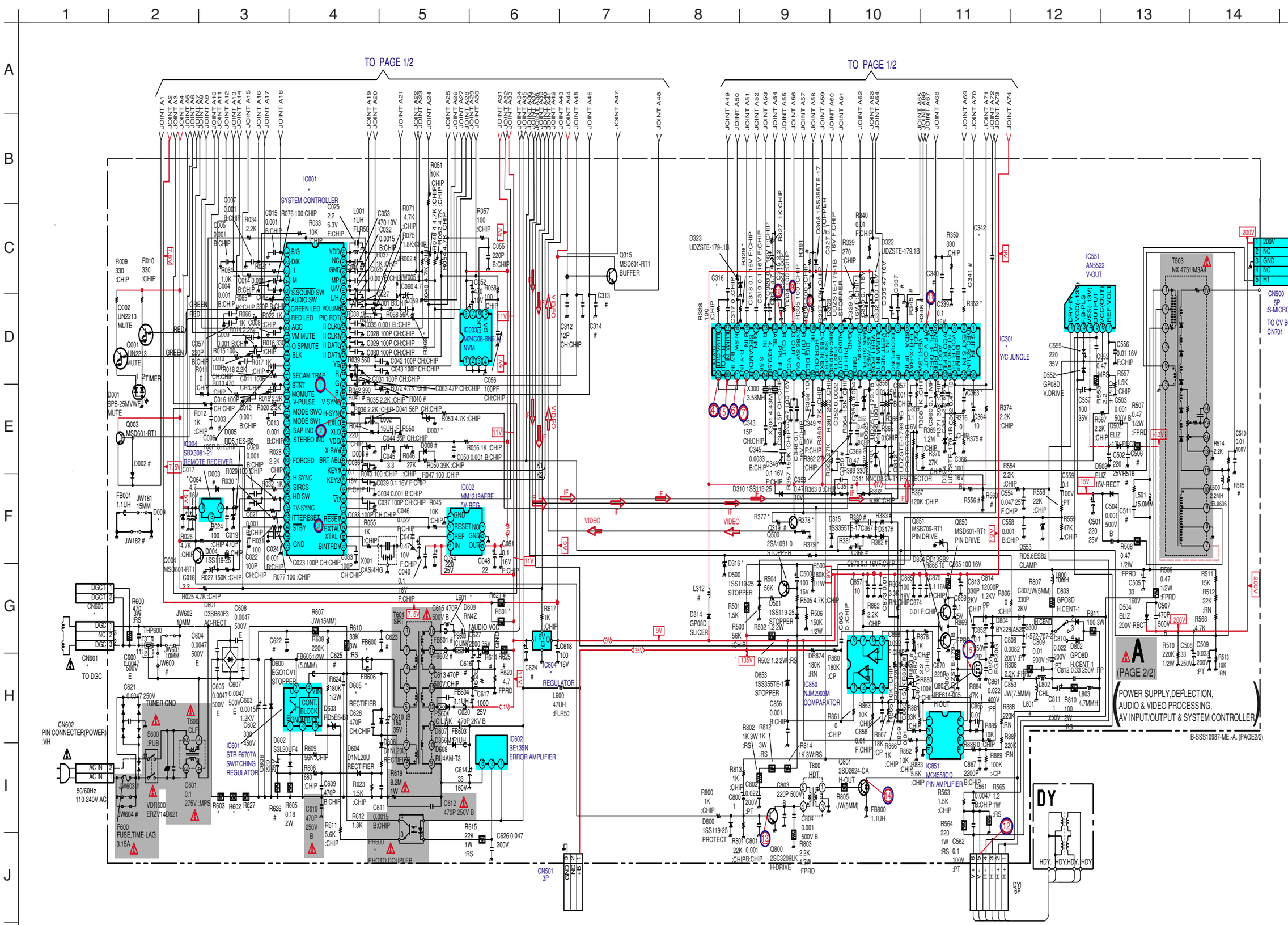

KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
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(3) V2 Board Schematic Diagram

(KV-HA21M81 ONLY)

V2 (TELE TEXT)

IC5801
SAA5264PS/M3
TEXT DECODER

P2.0/PWM P1.5
P2.1/PWM0 P1.4
P2.2/PWM1 SDA
P2.3/PWM2 SCL
P2.4/PWM3 P1.3
P2.5/PWM4 P1.2
P2.6/PWM5 P1.1
P2.7/PWM6 P1.0
P3.0/ADC0 VDDP
P3.1/ADC1 RESET
P3.2/ADC2 XTALOUT
P3.3/ADC3 XTALIN
VSSC OSCGND
SCL(NVRAM) VDDC
SDA(NVRAM) VSSP
P0.2 V-SYNC
P0.3 H-SYNC
P0.4 VDS
P0.5 R
P0.6 G
P0.7 B
VSSA VDDA
CVBS0 4/PWM7
CVBS1 COR
SYNC-FILTER TEST
I REF FRAME

D5801 #
D5802 DAP202K
R5831 4.7K :CHIP
R5830 4.7K :CHIP
R5829 100 :CHIP
R5828 100:CHIP
C5825 #
C5828 #
C5817 0.1 16V B:CHIP
FB5804 1.1UH
R5842 4.7K :CHIP
C5816 4.7
Q5803 2SC2712-YG RESET OUT
C5824 #
R5843 4.7K :CHIP
D5803 RD2.2M-T1B
X5801
C5820 56P CH:CHIP
C5822 0.0011 B:CHIP
C5826 4.7
R5846 1K :CHIP
C5830 0.1 16V :CHIP
C5818 56P CH:CHIP
FB5803 1.1UH
3.3V
C5827 #
R5851 2.2K :CHIP
C5815 0.1 16V B:CHIP
C5853 4.7
R5841 100 :CHIP
R5844 #
R5892 100 :CHIP
Q5801 2SC2712-YG
Q5805 #
R5850 #
R5845 1K :CHIP
R5886 #
R5884 100 :CHIP
C5852 0.022 F:CHIP
JR5811 470 :CHIP
C5843 #
R5853 5.6K :CHIP
R5859 150 :CHIP
R5860 150 :CHIP
R5862 150 :CHIP
R5875 #
R5861 #
R5849 #
Q5807 #
R5882 #
R5883 #
JR5812 470 :CHIP
R5887 #
C5823 4.7
R5839 1.5K :CHIP
C5821 0.1 16V F:CHIP
FB5801 1.1UH
R5848 #
R5863 #
R5893 #
Q5807 #
R5822 100:CHIP
C5806 0.1 16V F:CHIP
C5805 0.1 16V F:CHIP
R5821 24K :CHIP
R5877 #
Q5806 #
R5847 #
JR5813 470 :CHIP

C5835 0.1 16V F:CHIP
C5802 0.1 16V F:CHIP
IC5802
NJM2870F33-TE2
NF OUT
GND
CTRL IN
C5837 100 16V
FB5805 1.1UH
R5866 56 2W
R5899 100 :CHIP
R5880 #
R5879 #
R5878 10K :CHIP
Q5817 #
C5851 #
C5831 100 16V
C5833 #
R5857 22K :CHIP
Q5810 2SC2712-YG INVERTER
C5829 #
JR5801 #
JR5802 0 :CHIP
C5838 #
R5864 470 :CHIP
R5871 330 :CHIP
FILTER

R
G
B

CN5801
7P
:BTOB
TO A BOARD
CN001

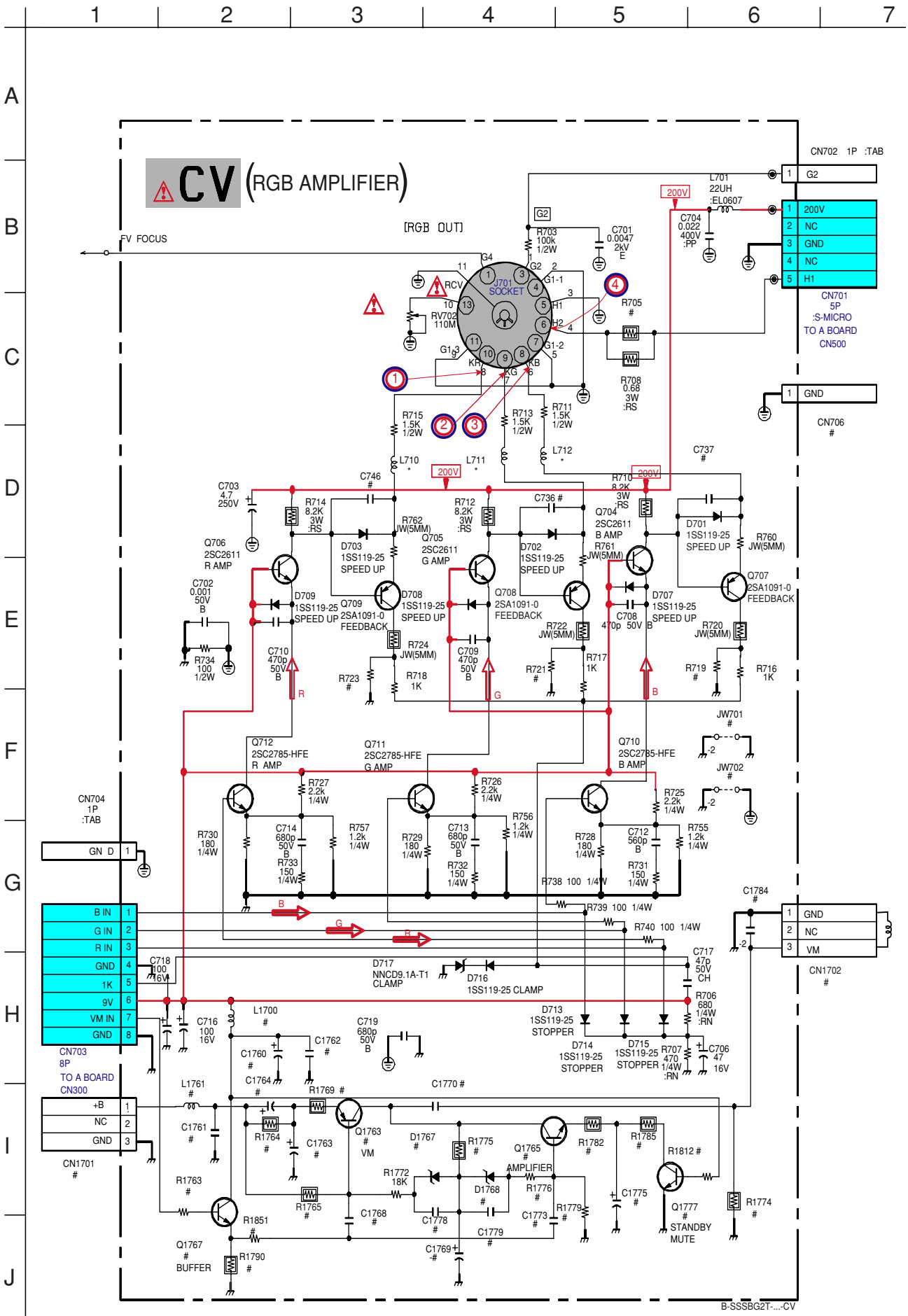
1	RED
2	GREEN
3	BLUE
4	BLK
5	GND
6	SDA
7	SCL

1	GND/STBY
2	VP
3	SCP/HP
4	GND
5	GND
6	CVBS
7	7.5V/5V

B-SSSBG2T-...-V2

CN5803
7P
:BTOB
TO A BOARD
CN002

(4) CV Board Schematic Diagram



A (1/3) Board ✲ Mark List

	KV-HA21M50 (Malaysia)	KV-HA21M60 (Thailand)	KV-HA21M80 (E)	KV-HA21M80/H (ME)	KV-HA21M81 (ME)	KV-HA21P52 (Thailand)	KV-HA21M80 (Vietnam)
C036	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C039	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C049	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C051	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C102	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C103	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C104	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C105	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C110	0.01 25V :CHIP	0.01 25V :CHIP	0.01 25V :CHIP	#	#	#	#
C112	0.01 25V :CHIP	0.01 25V :CHIP	0.01 25V :CHIP	#	#	#	#
C113	0.0047P :CHIP	0.0047P :CHIP	0.0047P :CHIP	#	#	#	#
C200	0.022	0.022 25V:CHIP	0.022	0.022	0.022	0.022 25V:CHIP	0.022 25V:CHIP
C201	0.022	0.022 25V:CHIP	0.022	0.022	0.022	0.022 25V:CHIP	0.022 25V:CHIP
C221	0.0047	0.0033	0.0047	0.0047	0.0047	0.0033	0.0047
C223	0.0047	0.0033	0.0047	0.0047	0.0047	0.0033	0.0047
C234	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP
C236	1	1	1	0.047 :PT	0.047 :PT	1	0.047
C241	0.001P	0.0033P	0.001P	0.0047P	0.0047P	0.0033P	0.001
C242	0.001P	0.0033P	0.001P	0.0033P	0.0033P	0.0033P	0.0047
C300	47P :CHIP	#	47P :CHIP	47P :CHIP	47P :CHIP	56P :CHIP	47P :CHIP
C302	47P :CHIP	47P :CHIP	47P :CHIP	47P :CHIP	47P :CHIP	#	47P :CHIP
C303	68P :CHIP	68P :CHIP	68P :CHIP	68P :CHIP	68P :CHIP	#	68P :CHIP
C308	390P :CHIP	0 :CHIP	390P :CHIP	390P :CHIP	390P :CHIP	390P :CHIP	390P :CHIP
C309	330P :CHIP	0 :CHIP	330P :CHIP	330P :CHIP	330P :CHIP	#	330P :CHIP
C310	390P :CHIP	0 :CHIP	390P :CHIP	390P :CHIP	390P :CHIP	390 CHIP	390P :CHIP
C311	470P :CHIP	0 :CHIP	470P :CHIP	470P :CHIP	470P :CHIP	#	470P :CHIP
C316	47P :CHIP	47P :CHIP	47P :CHIP	47P :CHIP	47P :CHIP	#	47P :CHIP
C318	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C319	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C320	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C327	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C328	0.22 25V:CHIP	0.22 16V:CHIP	0.22 25V:CHIP	0.22 25V:CHIP	0.22 25V:CHIP	0.22 16V:CHIP	0.22 25V:CHIP
C329	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C330	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C337	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C339	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C342	0.1 25V :CHIP	#	0.1 25V :CHIP	0.1 25V :CHIP	0.1 25V :CHIP	0.1 16V :CHIP	0.1 25V :CHIP
C346	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C348	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C353	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP
C355	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 16V:CHIP	0.47 10V:CHIP	0.47 16V:CHIP
C359	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C363	0.0047P :CHIP	#	0.0047P :CHIP	0.0047P :CHIP	0.0047P :CHIP	0.0047P :CHIP	0.0047P :CHIP
C369	0.47PP	0.47PP	0.47PP	0.47PP	0.47PP	0.47PP	#
C370	0 :CHIP	#	0 :CHIP	0 :CHIP	0 :CHIP	#	0 :CHIP
C371	10	10	10	10	10	10	#
C408	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C409	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C411	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C414	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C424	#	#	#	#	10	#	#
C520	10	10	10	#	10	#	#
C521	10	10	10	#	10	#	#
C554	0.047	0.047 25V:CHIP	0.047	0.047	0.047	0.047 25V:CHIP	0.047
C556	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C869	0.1	0.1 25V:CHIP	0.1	0.1	0.1	0.1 25V:CHIP	0.1
C872	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
C875	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 25V:CHIP	0.1 16V:CHIP	0.1 25V:CHIP
CF345	(F4.5C)	#	(F4.5C)	(F4.5C)	(F4.5C)	#	(F4.5C)
CF355	(F5.5C)	#	(F5.5C)	(F5.5C)	(F5.5C)	(F5.5C)	(F5.5C)
CF360	(F6.0C)	#	(F6.0C)	(F6.0C)	(F6.0C)	#	(F6.0C)
CF365	(F6.5C)	#	(F6.5C)	(F6.5C)	(F6.5C)	(F5.74B)	(F6.5C)
CN001	#	#	#	#	7P	#	#
CN002	#	#	#	#	7P	#	#
CN301	#	7P	#	#	#	#	#
CN302	#	7P	#	#	#	#	#
CN501	3P	#	3P	3P	3P	#	#
CN520	3P	3P	3P	#	3P	#	#
CN600	2P	#	2P	2P	2P	#	2P
CN601	2P	3P	2P	3P	3P	3P	2P
CT131	TRAP CERAMIC	TRAP CERAMIC	TRAP CERAMIC	#	#	TRAP CERAMIC	TRAP CERAMIC
CT345	(T4.5C)	(T4.5C)	(T4.5C)	(T4.5C)	(T4.5C)	#	(T4.5C)

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

A (2/3) Board ✲ Mark List

	KV-HA21M50 (Malaysia)	KV-HA21M60 (Thailand)	KV-HA21M80 (E)	KV-HA21M80/H (ME)	KV-HA21M81 (ME)	KV-HA21P52 (Thailand)	KV-HA21M80 (Vietnam)
CT360	(T60B)	(T60B)	(T60B)	(T60B)	(T60B)	#	(T60B)
CT365	(T65B)	(T65B)	(T65B)	(T65B)	(T65B)	(T55B)	(T65B)
D005	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.1ESB2
D006	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	RD5.6ESB2	#
D007	RD5.1SB-T2	UDZSTE.175.1B	RD5.1SB-T2	RD5.1SB-T2	RD5.1SB-T2	UDZSTE.175.1B	RD5.1SB-T2
D009	RD5.1SB-T2	UDZSTE.175.1B	RD5.1SB-T2	RD5.1SB-T2	RD5.1SB-T2	UDZSTE.175.1B	RD5.1SB-T2
D100	MA77	MA77	MA77	MA77	MA77	#	MA77
D301	1SS355TE-17	1SS355TE-17	1SS355TE-17	1SS355TE-17	1SS355TE-17	#	1SS355TE-17
D316	#	#	#	#	RD5-6ESB2	#	#
D520	1SS119-25	1SS119-25	1SS119-25	#	1SS119-25	#	#
D521	1SS119-25	1SS119-25	1SS119-25	#	1SS119-25	#	#
FB601	#	#	#	#	#	#	1.1UH
IC001	CXP85224A-085S	CXP85224A-081S	CXP85224A-085S	CXP85224A-080S	CXP85224A-080S	CXP85224A-081S	CXP85224A-082S
IC301	TDA8844/N2	TDA8844/N2	TDA8844/N2	TDA8844/N2	TDA8844/N2	TDA8843/N2	TDA8844/N2
IC520	NJM4556AD	NJM4556AD	NJM4556AD	#	NJM4556AD	#	#
IC604	PQ09RD11	KA78R09TU	PQ09RD11	PQ09RD11	PQ09RD11	KA78R09TU	KA78R09TU
JR007	#	#	#	#	0 :CHIP	#	#
JR030	0 :CHIP	0 :CHIP	0 :CHIP	#	0 :CHIP	#	#
JR033	#	#	#	0 :CHIP	0 :CHIP	#	0 :CHIP
JR034	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	#	0 :CHIP
JR100	#	#	#	#	#	0 :CHIP	#
JR205	0 :CHIP	#	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP
JR206	#	#	#	0.068P 16V :CHIP	0.068P 16V :CHIP	#	#
JR301	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	#	0 :CHIP
L200	68	68	68	68	47	47	68
L300	18UH	22UH	18UH	18UH	18UH	15UH	18UH
L301	12UH	12UH	12UH	12UH	12UH	#	12UH
L302	8.2UH	8.2UH	8.2UH	8.2UH	8.2UH	#	8.2UH
L303	8.2UH	8.2UH	8.2UH	8.2UH	8.2UH	#	8.2UH
L306	1.8UH	#	1.8UH	1.8UH	1.8UH	2.2UH	1.8UH
L307	2.2UH	#	2.2UH	2.2UH	2.2UH	#	2.2UH
L308	2.2UH	#	2.2UH	2.2UH	2.2UH	2.2UH	2.2UH
L309	2.7UH	#	2.7UH	2.7UH	2.7UH	#	2.7UH
L310	27UH	27UH	27UH	27UH	27UH	#	2.7UH
L601	1UH	1UH	1UH	1UH	1UH	1UH	#
PH600	PC123FC	ON3171-R	PC123FC	PC123FC	PC123FC	ON3171-R	PC123FC
Q005	#	UN2213	#	UN2213	#	UN2213	MSD601-RT1
Q101	MSD601-RT1	MSD601-RT1	MSD601-RT1	#	#	#	#
Q103	UN2216	UN2216	UN2216	UN2216	UN2216	#	UN2216
Q104	UN2216	UN2216	UN2216	UN2216	UN2216	#	UN2216
Q201	MSD601-RT1	#	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1
Q300	MSB709-RT1	MSB709-RT1	MSB709-RT1	MSB709-RT1	MSB709-RT1	#	MSB709-RT1
Q302	MSB709-RT1	MSB709-RT1	MSB709-RT1	MSB709-RT1	MSB709-RT1	#	MSB709-RT1
Q307	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	#	MSD601-RT1
Q310	UN2216	UN2216	UN2216	UN2216	UN2216	#	UN2216
Q311	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	#	MSD601-RT1
Q313	UN2216	UN2216	UN2216	UN2216	UN2216	#	UN2216
Q314	UN2211	UN2211	UN2211	UN2211	UN2211	#	UN2211
Q318	MSD601-RT1	#	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1	MSD601-RT1
Q319	#	#	#	#	MSD601-RT1	#	#
Q520	2SC3311A-QRSTA	2SC3311A-QRSTA	2SC3311A-QRSTA	#	2SC3311A-QRSTA	#	#
Q962	MSB709-RT1	#	MSB709-RT1	MSB709-RT1	MSB709-RT1	#	#
R021	1.0K :CHIP	1.0K :CHIP	1.0K :CHIP	1.0K :CHIP	1.0K :CHIP	#	1.0K :CHIP
R030	#	100 :CHIP	#	#	#	#	#
R064	1K	1K	1K	1K	1K	#	1K
R069	1.0K :CHIP	1.0K :CHIP	1.0K :CHIP	#	1.0K :CHIP	#	#
R070	4.7K :CHIP	4.7K :CHIP	4.7K :CHIP	#	4.7K :CHIP	#	#
R073	#	#	#	22K :CHIP	#	22K :CHIP	22K :CHIP
R076	#	#	#	100 :CHIP	100 :CHIP	#	100 :CHIP
R101	3.9K :CHIP	3.9K :CHIP	3.9K :CHIP	#	#	#	#
R102	4.7K :CHIP	4.7K :CHIP	4.7K :CHIP	#	#	#	#
R104	270 :CHIP	270 :CHIP	270 :CHIP	#	#	#	#
R105	68 :CHIP	68 :CHIP	68 :CHIP	#	#	#	#
R111	10K	10K	10K	10K	10K	#	10K
R112	6.8K	6.8K	6.8K	6.8K	6.8K	#	6.8K
R113	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	#	2.2K :CHIP
R114	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	#	2.2K :CHIP
R201	1.5K:CHIP	1K:CHIP	1.5K	1.5K	1.5K	1K	1.5K
R203	470	0:CHIP	470	470	470	0:CHIP	470
R208	10K :CHIP	10K :CHIP	10K :CHIP	#	#	10K :CHIP	#
R209	10K :CHIP	10K :CHIP	10K :CHIP	#	#	10K :CHIP	#
R221	100 :CHIP	#	100 :CHIP	100 :CHIP	100 :CHIP	100 :CHIP	100 :CHIP

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

A (3/3) Board ✲ Mark List

	KV-HA21M50 (Malaysia)	KV-HA21M60 (Thailand)	KV-HA21M80 (E)	KV-HA21M80/H (ME)	KV-HA21M81 (ME)	KV-HA21P52 (Thailand)	KV-HA21M80 (Vietnam)
R222	2.2K :CHIP	#	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP	2.2K :CHIP
R301	220 :CHIP	220 :CHIP	220 :CHIP	220 :CHIP	220 :CHIP	#	220 :CHIP
R303	220 :CHIP	220 :CHIP	220 :CHIP	220 :CHIP	220 :CHIP	#	220 :CHIP
R304	1.2K :CHIP	1.0K :CHIP	1.2K :CHIP	1.2K :CHIP	1.2K :CHIP	1.2K :CHIP	1.2K :CHIP
R305	680 :CHIP	680 :CHIP	680 :CHIP	680 :CHIP	680 :CHIP	#	680 :CHIP
R308	120 :CHIP	#	120 :CHIP	120 :CHIP	120 :CHIP	#	120 :CHIP
R309	150 :CHIP	#	150 :CHIP	150 :CHIP	150 :CHIP	#	150 :CHIP
R318	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP
R319	470 :CHIP	470 :CHIP	470 :CHIP	470 :CHIP	470 :CHIP	#	470 :CHIP
R324	470 :CHIP	470 :CHIP	470 :CHIP	470 :CHIP	470 :CHIP	#	470 :CHIP
R325	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP
R326	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP
R329	560 :CHIP	560 :CHIP	560 :CHIP	560 :CHIP	470 :CHIP	560 :CHIP	560 :CHIP
R330	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	470 :CHIP	0 :CHIP	0 :CHIP
R331	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	470 :CHIP	0 :CHIP	0 :CHIP
R332	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	470 :CHIP	0 :CHIP	0 :CHIP
R353	820K :CHIP	#	820K :CHIP	820K :CHIP	820K :CHIP	820K :CHIP	820K :CHIP
R354	820K :CHIP	#	820K :CHIP	820K :CHIP	820K :CHIP	820K :CHIP	820K :CHIP
R355	3.3K :CHIP	#	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP
R356	3.3K :CHIP	#	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP	3.3K :CHIP
R377	#	#	#	#	100 :CHIP	#	#
R378	#	#	#	#	1.0K :CHIP	#	#
R379	#	#	#	#	2.2K :CHIP	#	#
R384	#	100 :CHIP	#	#	#	#	#
R385	#	100 :CHIP	#	#	#	#	#
R386	#	100 :CHIP	#	#	#	#	#
R387	#	100 :CHIP	#	#	#	#	#
R388	#	100 :CHIP	#	#	#	#	#
R389	330K	330K	330K	330K	330K	330K	#
R393	0 :CHIP	#	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP	0 :CHIP
R520	10K :CHIP	10K :CHIP	10K :CHIP	#	10K :CHIP	#	#
R521	10K :CHIP	10K :CHIP	10K :CHIP	#	10K :CHIP	#	#
R522	10K :CHIP	10K :CHIP	10K :CHIP	#	10K :CHIP	#	#
R523	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP	#	#
R524	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP	#	#
R525	0 :CHIP	0 :CHIP	0 :CHIP	#	0 :CHIP	#	#
R526	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP	#	#
R527	22K :CHIP	22K :CHIP	22K :CHIP	#	22K :CHIP	#	#
R528	10 1W :RS	10 1W :RS	10 1W :RS	#	10 1W :RS	#	#
R601	#	#	#	#	33 2W :RS	#	#
R602	0.68 10W	1.0 10W	0.68 10W	0.68 10W	0.68 10W	1.0 10W	0.68 10W
R603	0.68 10W	1.0 10W	0.68 10W	0.68 10W	0.68 10W	1.0 10W	0.68 10W
R627	0.68 10W	1.0 10W	0.68 10W	0.68 10W	0.68 10W	1.0 10W	0.68 10W
T600	TRANSFORMER LINE FILTER	COIL LINE FILTER	TRANSFORMER LINE FILTER	TRANSFORMER LINE FILTER	TRANSFORMER LINE FILTER	COIL LINE FILTER	COIL LINE FILTER

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

CV Board ✲ Mark List

	KV-HA21M50 (Malaysia)	KV-HA21M60 (Thailand)	KV-HA21M80 (E)	KV-HA21M80/H (ME)	KV-HA21M81 (ME)	KV-HA21P52 (Thailand)	KV-HA21M80 (Vietnam)
L710	10UH	10UH	10UH	10UH	10UH	10UH	33UH
L711	#	#	#	#	#	#	22UH
L712	#	#	#	#	#	#	22UH

Note: The parts indicated as "#" in this circuit diagram are not listed here, as they are not used for these models.

5-4. VOLTAGE MEASUREMENTS

A BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
IC001	1	(4.6)[0]
	2	0
	3	0
	4	(0)[4.5]
	5	4.8
	6	(0)[4.9]
	7	0
	8	0
	9	4.9
	10	4.6
	11	0
	12	0
	13	0
	14	4.7
	15	4.9
	16	0
	17	4.7
	18	0
	19	(0.9)[1.8]
	20	0
	21	4.9
	22	0
	23	(0)[4.9]
	24	(4.9)[0]
	25	0.4
	26	3.6
	27	0
	28	(0.8)[1.6]
	29	4.9
	30	4.7
	31	4.9
	32	0
	33	4.9
	34	2.3
	35	2.1
	36	4.9
	37	0
	38	(2)[4.8]
	39	(0.3)[1]
	40	4.9
	41	4.9
	42	(3.4)[3.0]
	43	(0.9)[1.6]
	44	4.9
	45	(4.9)[2.6]
	46	4.9
	47	0.4
	48	4.7
	49	0
	50	0
	51	0
	52	0
	53	4.9
	54	4.5
	55	4.9
	56	4.5
	57	3.6
	58	(0)[0.3]
	59	8.9
	60	(0.1)[8.9]
	61	0
	62	0
	63	4.9
	64	4.9
IC002	1	0
	2	4.9
	3	4.8
	4	11
	5	4.9
	6	0
	7	0
IC003	1	0
	2	0
	3	0
	4	0
	5	4.9
	6	4.9
	7	0
	8	4.9
IC004	1	4.7
	2	3.6
	3	0
IC101	I	9
	G	0
	O	0
IC201	1	4.5
	2	4.5
	3	4.5
	4	4.5
	5	4.5
	6	4.5
	7	4.5
	8	4.5
	9	4.5
	10	4.5
	11	4.5
	12	4.5
	13	4.5
	14	4.5
	15	4.5
	16	4.5
	17	4.5
	18	4.5
	19	4.5
	20	0
	21	4.6
	22	4.6
	23	4.5
	24	9
	25	0
	26	3.8
	27	3.8
	28	4.5
IC203	1	0
	2	0
	3	20.3
	4	0
	5	0
	6	0
	7	(*)[9.8]
	8	0.4
	9	0
	10	21
	11	9.7
	12	9.7
IC301	1	(0.9)[1.1]
	2	3.7
	3	0
	4	0
	5	(2.4)[3.6]
	6	(2.9)[4.4]
	7	4.6
	8	4.5
	9	6.6
	10	0
	11	3.3
	12	8.2
	13	(3.8)[4.6]
	14	0
	15	3.1
	16	(0.2)[0.5]
	17	(3.3)[3.9]
	18	6.7
	19	(2.8)[3.1]
	20	(2.7)[2.9]
	21	(2.8)[3.0]
	22	3.3
	23	3.4
	24	3.4
	25	3.4
	26	0
	27	(2.7)[2.9]
	28	(2.7)[2.9]
	29	2.3
	30	2.4
	31	2.3
	32	2.4
	33	0.3
	34	2.4
	35	2.4
	36	(4.8)[4.3]
	37	8.2
	38	2.5
	39	4.9
	40	1.5
	41	0.64
	42	3.1
	43	3.9
	44	0
	45	4.1
	46	1.3
	47	1.4
	48	4.6
	49	4.6
	50	1.6
	51	3.7
	52	3.8
	53	(4.6)[1.2]
	54	(4.2)[8.2]
	55	2.9
	56	(3.2)[4.1]
IC402	1	5.5
	2	2.5
	3	2.5
	4	0
	5	(9)[2.5]
	6	(5.5)[2.5]
	7	(2.5)[5.5]
	8	(2.4)[9]
IC520	1	9.4
	2	5.8
	3	5.8
	4	0
	5	2.2
	6	2.2
	7	2.2
	8	11.6

A BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
IC551	1	0.5
	2	13.6
	3	-12
	4	-13
	5	0.2
	6	13.7
	7	0.5
IC601	1	*
	2	*
	3	(*)[159]
	4	(*)[7]
	5	(*)[2]
IC602	1	(*)[118]
	2	(*)[135]
	3	0
IC604	1	(11)[11.6]
	2	9
	3	0
	4	4.7
IC850	1	2.1
	2	0.7
	3	1.5
	4	0
	5	2.5
	6	2.1
	7	5.8
	8	9
IC851	1	(2.3)[2.7]
	2	3.2
	3	3.2
	4	(0)[0.1]
	5	(0)[2.8]
	6	(2.6)[2.8]
	7	3.7
	8	9
Q001	B	0
	C	4.9
	E	0
Q002	B	0
	C	4.9
	E	0
Q003	B	0
	C	4.9
	E	0
Q004	B	0.1
	C	4.9
	E	0.1
Q005	B	0
	C	4.7
	E	(0)[0.2]
Q100	B	(3.6)[7.4]
	C	9
	E	(4.2)[8.1]
Q102	B	3.1
	C	2.4
	E	9
Q103	B	0
	C	3.2
	E	0
Q104	B	0
	C	(0)[5.5]
	E	3.2
Q105	B	0
	C	9(0)
	E	(0.3)[0.6]
Q106	B	0
	C	3.8
	E	0.6
Q201	B	5.6
	C	9
	E	6.2
Q202	B	(6)[3.3]
	C	(0)[1.3]
	E	(13)[13.4]
Q203	B	(5.5)[5.2]
	C	13
	E	(6.1)[5.8]
Q204	B	21.4
	C	21.4
	E	20.7
Q205	B	0
	C	0
	E	(4.7)[0.7]
Q208	B	1.3
	C	1.4
	E	4.8
Q300	B	(3.1)[0.2]
	C	0
	E	0
Q301	B	(3.2)[4.1]
	C	0
	E	(2.4)[4.8]
Q302	B	(0)[4.1]
	C	0
	E	(3.8)[3.6]
Q303	B	(2.4)[4.8]
	C	(7.8)[4.8]
	E	(3.0)[5.5]
Q304	B	(3.0)[5.8]
	C	(2.4)[4.8]
	E	(0)[9]
Q305	B	(2.9)[5.8]
	C	(2.3)[4.8]
	E	(2.3)[9]
Q306	B	9
	C	9
	E	(2.9)[4.3]
Q307	B	9
	C	9
	E	(2.9)[4.4]
Q308	B	0
	C	9
	E	0
Q309	B	(2.3)[9]
	C	9
	E	(2.9)[0.1]
Q310	B	0
	C	9.0
	E	0
Q311	B	(9)[3.5]
	C	9
	E	(2.9)[4.4]
Q312	B	0
	C	(0)[9.0]
	E	(3.8)[0]
Q313	B	0
	C	(8.9)[0]
	E	(0)[3.3]
Q314	B	0
	C	0
	E	4
Q315	B	2.7
	C	9
	E	0
Q316	B	0
	C	4.9
	E	0
Q317	B	0
	C	9
	E	0
Q318	B	2.6
	C	6.2
	E	3.2
Q319	B	3.8
	C	(8.2)[0.2]
	E	4.4
Q320	B	0
	C	(3.3)[5.4]
	E	0
Q400	B	11.4
	C	(1)[4.4]
	E	11.6
Q401	B	0
	C	(0.1)[0]
	E	(0.1)[0.2]
Q402	B	0
	C	(0.1)[0]
	E	(0.1)[0.2]
Q403	B	5.2
	C	0
	E	4.5
Q404	B	5.2
	C	0
	E	4.5
Q405	B	5.1
	C	0
	E	(4.4)[4.5]
Q406	B	1.8
	C	4.2
	E	2.5
Q407	B	3.5
	C	9
	E	4.2
Q500	B	(*)[133.7]
	C	0
	E	(*)[133.6]
Q520	B	0.6
	C	0
	E	0
Q800	B	0
	C	(*)[30]
	E	0
Q801	B	(0.1)[0]
	C	(*)[99]
	E	(*)[0]
Q802	D	(5.6)[10]
	G	(8)[5.5]
	S	0
Q850	B	5.6
	C	9
	E	5.9
Q851	B	5.6
	C	0
	E	5.7
Q922	B	2.0
	C	5.3
	E	2.7
Q923	B	(1.4)[1.9]
	C	(2.5)[9]
	E	(2.1)[2.4]

A BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
Q924	B	(5.5)[0]
	C	9
	E	(6.1)[8.5]
Q956	B	0
	C	0
	E	0.6
Q961	B	(1.9)[1.4]
	C	(9)[2.4]
	E	(2.5)[2.1]
Q962	B	8.3
	C	3.2
	E	7.7
Q964	B	0.9
	C	6.6
	E	1.5
Q966	B	1.0
	C	6.1
	E	1.6

A3 BOARD VOLTAGE LIST

Ref	Pin No.	Voltage[v]
IC2401	1	5
	2	5.5
	3	5.5
	4	0
	5	2.3
	6	0
	7	0
	8	0
	9	0
	10	0
	11	5.1
	12	4.7
	13	4.3
	14	0
	15	0
	16	0
	17	0
	18	0
	19	0
	20	5.1
	21	0
	22	5
	23	0
	24	0
	25	0
	26	0
	27	0
	28	0
	29	0
	30	0
	31	0
	32	0
	33	0
	34	0
	35	3.3
	36	0
	37	2.4
	38	2.4
	39	0
	40	4.8
	41	0
	42	0
	43	0
	44	0
IC2601	I	7
	G	0
	O	5.1

Ref	Pin No.	Voltage[v]
IC2701	1	0
	2	4.3
	3	4.2
	4	4.3
	5	4.3
	6	4.2
	7	0
	8	0
	9	0
	10	0
	11	0
	12	0
	13	34
	14	4.2
	15	4.3
	16	0
	17	*
	18	*
	19	5
	20	0
	21	*
	22	*
	23	*
	24	*
	25	*
	26	0
	27	0
	28	0
	29	3
	30	3.6
	31	0
	32	0.8
Q2101	B	*
	C	*
	E	*
Q2301	B	*
	C	*
	E	*
Q2302	B	3.9
	C	9
	E	3.2
Q2303	B	3.9
	C	9
	E	3.1
Q2304	B	3.9
	C	9
	E	3.2

CV BOARD VOLTAGE LIST

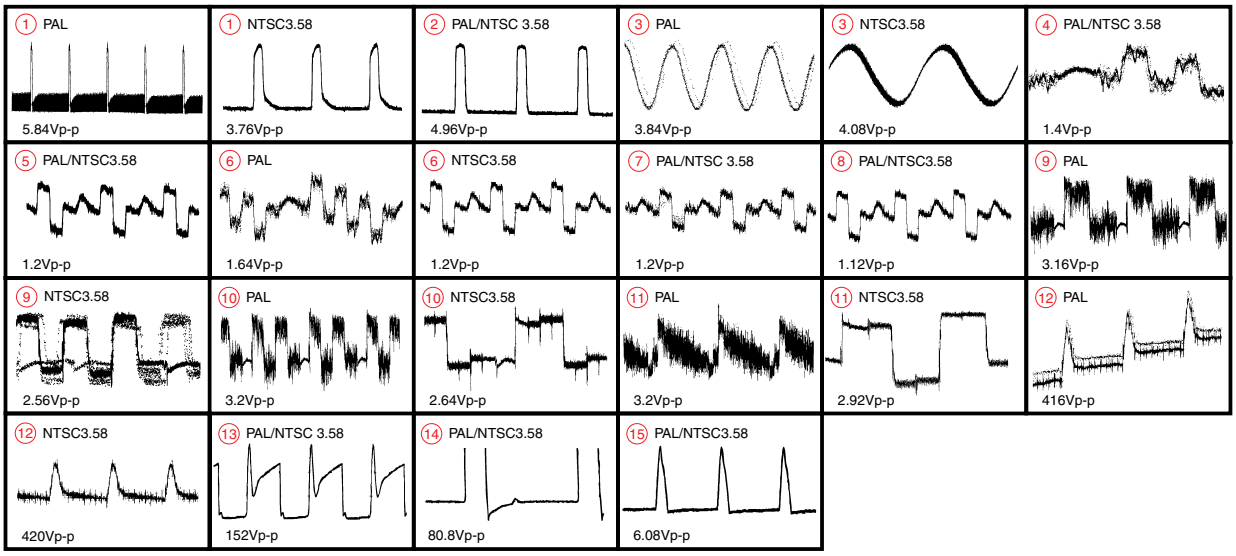
Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]
J701	KR	(110)[102]	Q707	B	(105.6)[96]	Q712	B	2.8
	KG	(112)[104]		C	(7.8)[8.2]		C	8.4
	KB	(103)[96]		E	(102.5)[95]		E	2.1
	H2	(0.1)[0]	Q708	B	(112)[104]	Q1763	B	133.9
	G2	218		C	8		C	68.9
Q704	B	(8.7)[9]		E	(109)[102]		E	134.5
	C	(105.8)[96]	Q709	B	(111)[102]	Q1765	B	0.9
	E	(8.1)[8.4]		C	(8.1)[8.3]		C	68.9
Q705	B	9		E	(108)[100]		E	0.3
	C	(112)[104]	Q710	B	2.9	Q1767	B	5.5
	E	8.3		C	8.4		C	9
Q706	B	9		E	(2.2)[2.4]		E	4.8
	C	(111)[103]	Q711	B	(2.7)[2.9]	Q1777	B	0.7
	E	8.4		C	8.4		C	0
				E	(2.1)[2.3]		E	0

V2 BOARD VOLTAGE LIST

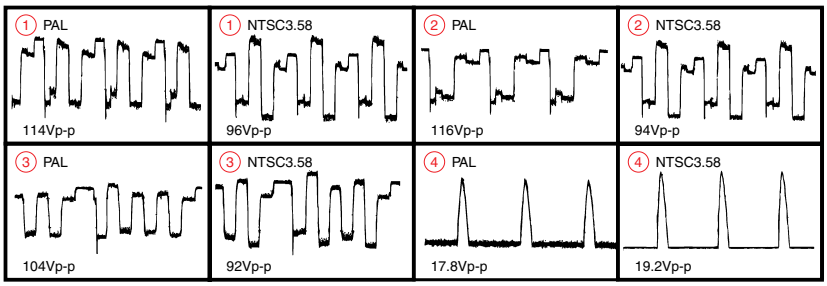
Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]	Ref	Pin No.	Voltage[v]
IC5801	1	(1.4)[1.8]		26	1.2		51	3.3
	2	(1.4)[1.8]		27	0		52	3.3
	3	(1.4)[1.8]		28	0	IC5802	1	4.8
	4	(1.4)[1.8]		29	(1.4)[1.7]		2	0
	5	(1.4)[1.8]		30	(1.4)[1.7]		3	1.2
	6	(1.4)[1.8]		31	3.2		4	3.3
	7	(1.4)[1.8]		32	0		5	5.3
	8	(1.4)[1.8]		33	0	Q5801	B	0
	9	(1.4)[1.8]		34	0		C	3.2
	10	(1.4)[1.8]		35	0		E	0
	11	(1.4)[1.8]		36	2.6	Q5803	B	0
	12	(1.4)[1.8]		37	4.7		C	0
	13	0		38	0		E	0.6
	14	(1.4)[1.6]		39	3.2	Q5805	B	0
	15	(1.4)[1.6]		40	0		C	2.7
	16	(1.4)[1.6]		41	1.5		E	0
	17	(1.4)[1.6]		42	1.6	Q5806	B	0
	18	(1.4)[1.6]		43	0		C	3.3
	19	(1.4)[1.6]		44	3.3		E	1.4
	20	(1.4)[1.6]		45	(1.5)[1.8]	Q5810	B	0
	21	(1.4)[1.6]		46	(1.5)[1.8]		C	2.7
	22	0		47	(1.5)[1.8]		E	0
	23	0.9		48	(1.5)[1.7]	Q5817	B	0
	24	0		49	4.6		C	4.7
	25	0.9		50	(4.6)[4.4]		E	0

5-5. WAVEFORMS

A BOARD WAVEFORM



CV BOARD WAVEFORM

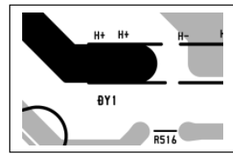


KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
RM-969

5-6. PRINTED WIRING BOARDS AND PARTS LOCATION

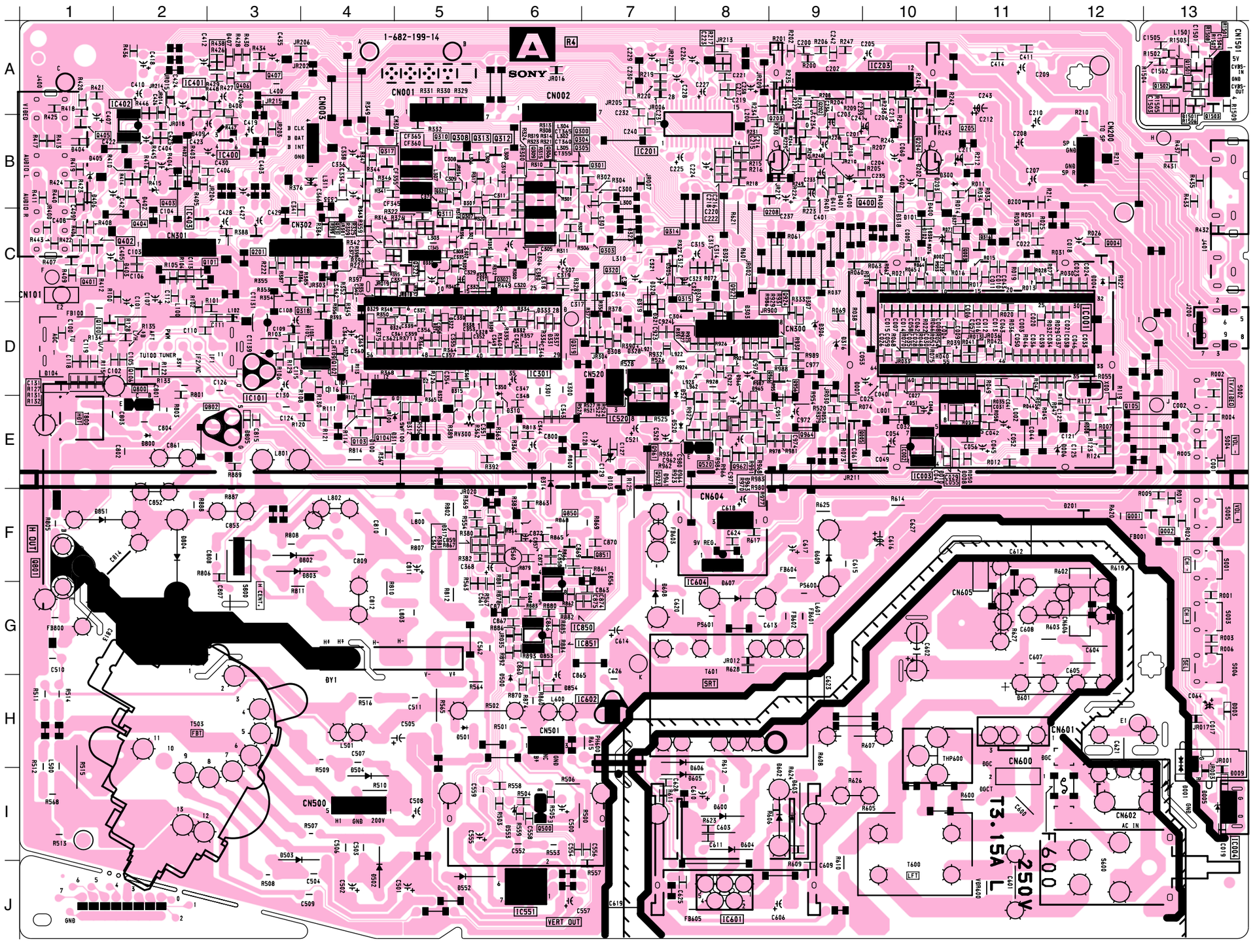
PRINTED WIRING BOARDS

A [POWER SUPPLY,DEFLECTION,
AUDIO AND VIDEO PROCESSING,
AUDIO/VIDEO INPUT/OUTPUT AND SYSTEM CONTROLLER]



NOTE:
The circuit indicated at left contains high voltage of over 1220 Vp-p. Please pay attention when inspecting or repairing it to prevent an electric shock.

– A Board –



A BOARD

IC

IC001	D-12
IC002	E-10
IC003	E-10
IC004	I-13
IC101	D-3
IC201	B-7
IC203	A-10
IC301	D-6
IC400	B-3
IC401	A-2
IC402	A-2
IC403	C-2
IC520	E-7
IC551	J-6
IC601	J-8
IC602	H-7
IC604	G-8
IC850	G-6
IC851	G-6
PH600	H-7

TRANSISTOR

Q001	F-12
Q002	F-13
Q003	C-11
Q004	C-12
Q005	E-10
Q100	D-1
Q101	C-3
Q102	D-4
Q103	E-4
Q104	E-4
Q105	E-12
Q106	D-2
Q201	C-3
Q203	B-9
Q202	A-9
Q204	B-10
Q205	B-11
Q208	C-9
Q300	B-7
Q301	B-7
Q302	C-6
Q303	C-7
Q304	B-7
Q305	B-7
Q306	B-6
Q307	C-5
Q308	B-5
Q309	B-6
Q310	B-5
Q311	C-5
Q312	B-6
Q313	B-5
Q314	C-7
Q315	C-8
Q316	C-11
Q317	B-4
Q318	D-4
Q319	D-6
Q320	C-7
Q321	B-5
Q400	B-10
Q401	C-1
Q402	C-2
Q403	B-2
Q404	C-2
Q405	B-1
Q406	A-3
Q407	A-3
Q500	I-6
Q520	E-8
Q800	D-2
Q802	E-3
Q850	F-6
Q851	F-7
Q922	C-8
Q923	E-7
Q924	C-9
Q956	D-9
Q961	E-7
Q962	E-8
Q964	E-9
Q966	D-9

DIODE

D001	I-13
D002	C-10
D003	H-13
D004	C-12
D005	I-13
D006	E-12
D007	D-9
D008	E-11
D009	I-13
D100	E-4
D101	C-10
D102	C-10
D103	E-7
D104	D-1
D200	B-11
D201	F-12
D202	B-10
D203	B-10
D300	B-10
D301	B-5
D302	C-8
D303	D-8
D304	C-10
D305	C-7
D306	D-9
D307	D-9
D308	D-7
D309	D-6
D310	E-6
D312	E-5
D314	E-6
D315	D-5
D316	D-9
D317	F-5
D318	C-10
D319	D-7
D320	C-7
D321	D-7
D322	D-5
D323	C-7
D324	D-4
D325	D-5
D326	C-8
D327	C-10
D328	D-7
D400	C-10
D401	B-9
D402	B-2
D403	C-2
D404	B-1
D405	B-1
D406	B-1
D407	A-3
D408	A-3
D409	B-2
D410	B-9
D500	H-6
D501	H-5
D502	J-4
D503	I-3
D504	I-4
D520	E-7
D521	D-8
D522	J-5
D553	I-6
D600	I-8
D602	I-9
D603	I-9
D604	I-8
D605	I-8
D606	H-8
D607	G-8
D608	G-7
D609	F-9
D800	E-2
D802	F-4
D803	F-4
D804	F-2
D805	E-3
D851	F-1
D853	G-6
D854	H-6
D961	E-7
D963	E-8
D964	E-8
D965	D-8

KV-HA21M50/HA21M60/HA21M80/
KV-HA21M80/H/HA21M81/HA21P52
RM-969

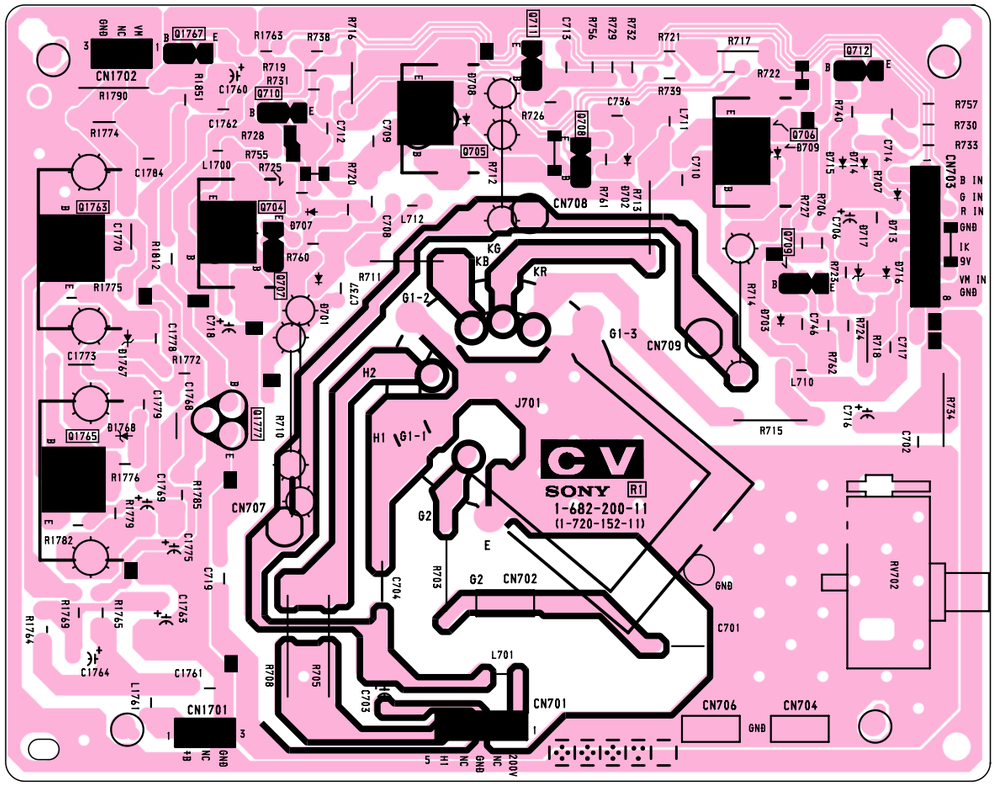
PRINTED WIRING BOARDS

CV [RGB AMPLIFER]

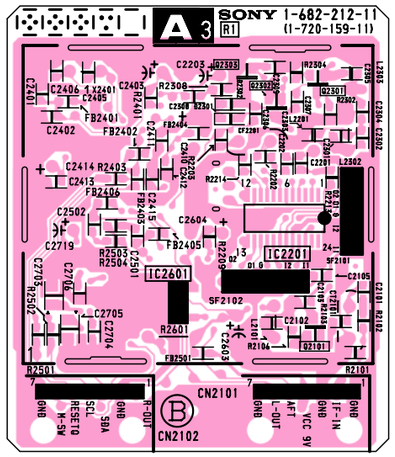
A3 [STEREO DECODER]

V2 [TELETEXT]

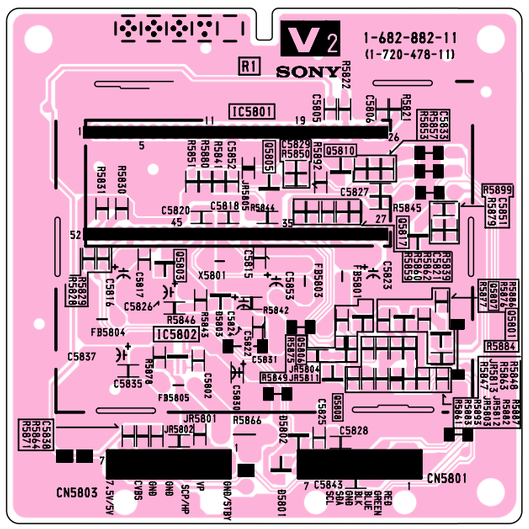
– CV Board –



– A3 Board – (KV-HA21M60 ONLY)

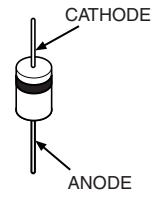
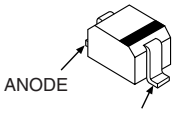
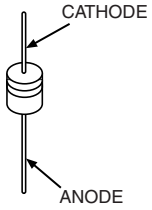
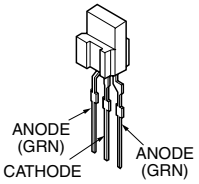
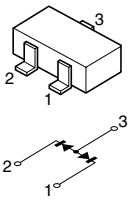


– V2 Board – (KV-HA21M81 ONLY)

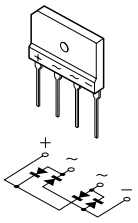
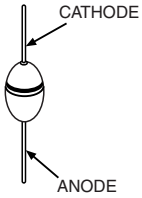
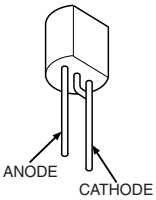
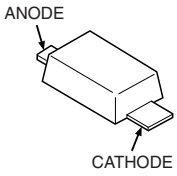
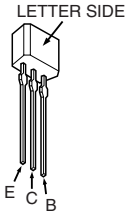


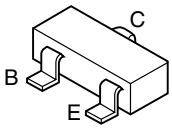
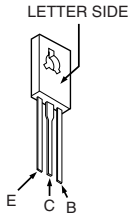
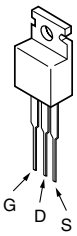
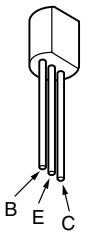
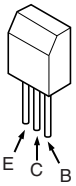
5-7. SEMICONDUCTORS

DIODE

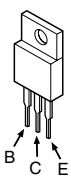
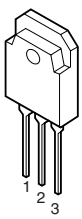
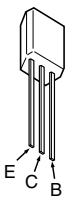
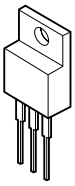
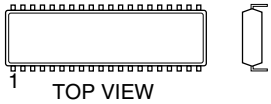
					
D1NL20U D356M-F ELIZ EG01CV1 HZS361-TE GPO8D	EGP20G NNCD8.2A-T1 NNCD9.1A-T1 RU4AM-T3 1SS119-25	RD5.6ESB2 RD5.1SB-T2 UDZSTE-175.1B UDZSTE-179.1B 1SS355TE-17	RD2.2ES-B2 RD5.1ESB2 RD15ES-B1 S3L20UF4 RD13SB2 RD39ES-B2	SPB-25MVWF	DA204K

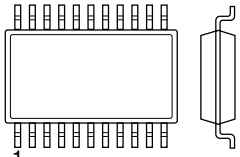
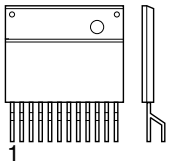
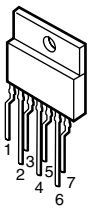
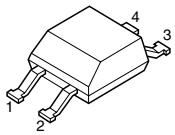
TRANSISTOR

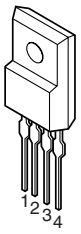
					
D3SB60F3	BY228	UPC574J	RN4Z	MA77	2SC2785-HFE

					
DTC144EKA MSD601-RT1 MSB709-RT1 UN2211 UN2213 UN2216	2SA1162-G 2SC1623-L5L6 2SC2712-YG	2SC2611	IRF614-005	2SC3779C	2SC3209LK 2SC3733

IC

				DIP  TOP VIEW Dual In-line Package Pin 6~98
2SA1837 2SC4793	2SD2624-CA	2SA1091-0	L78M05T-FA	M24C08-BN6 (A)(8 PIN) CXP85224A-080S (64 PIN) CXP85224A-081S (64 PIN) CXP85224A-082S (64 PIN) CXP85224A-085S (64 PIN) NJM4556AD (8 PIN) TDA7438D013TR (28 PIN)

SOP  Small Outline L-Leaded Pin 8～98	MARKING SIDE VIEW  Zig-zag In -line Package Pin 6～99	 	
MM1319AFBE (7 PIN) NJM2903M (8 PIN)	TDA8844	AN5522	PC123F2



PQO9RD11

SECTION 6
EXPLODED VIEWS

NOTE:

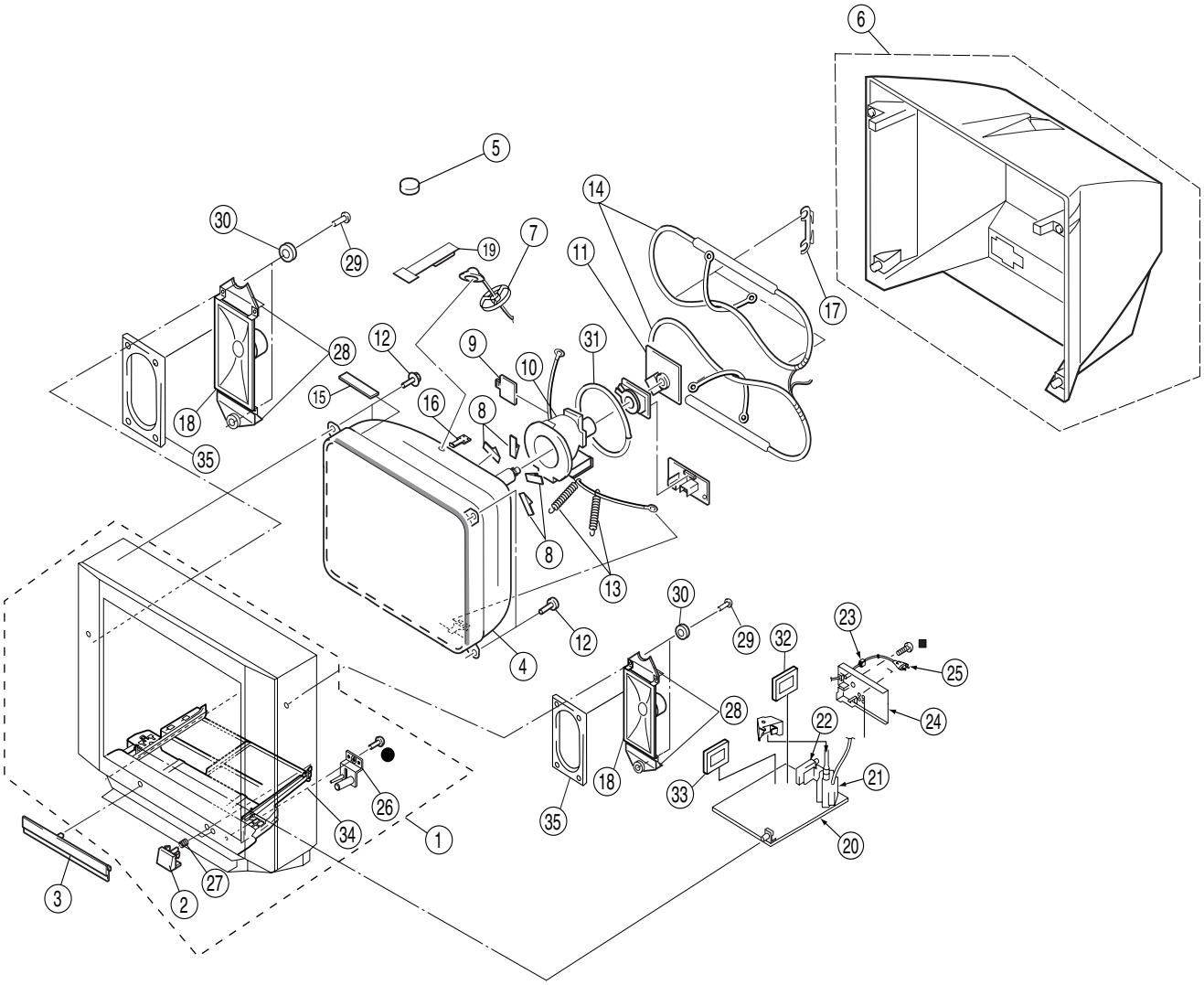
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. PICTURE TUBE AND CHASSIS

● : 7-685-648-79 SCREW +BVTP 3 × 12
■ : 7-685-663-71 SCREW +BVTP 4 × 16

Caution : Do not take out CRT Support block while TV set in standing position.



REF. NO.		PART NO.	DESCRIPTION	REMARK
1		X-4039-609-1	BEZNET ASSY	2,27,28
			(KV-HA21M50/HA21M80/HA21M81)	
		X-4039-726-1	BEZNET ASSY (KV-HA21M60/HA21P52)	
		X-4039-747-1	BEZNET ASSY (KV-HA21M80/H)	
2		4-083-943-01	BUTTON POWER (KV-HA21M50/HA21M80/	
			HA21M80/H/HA21M81)	
		4-085-902-01	BUTTON POWER (KV-HA21M60/HA21P52)	
3		X-4039-873-1	DOOR ASSY, CONTROL (KV-HA21M60)	
		X-4039-865-1	DOOR ASSY, CONTROL (KV-HA21M80/H)	
		X-4039-864-1	DOOR ASSY, CONTROL (KV-HA21M81)	
		X-4039-872-1	DOOR ASSY, CONTROL (KV-HA21P52)	
		X-4039-851-01	DOOR ASSY, CONTROL	
			(KV-HA21M50/HA21M80)	
4	⚠	8-738-812-05	PICTURE TUBE (A51LPT70X)	
			(KV-HA21M50/HA21M60/HA21P52)	
	⚠	8-738-809-05	PICTURE TUBE (A51LPT70X)	
			(KV-HA21M80/HA21M80/H/HA21M81)	
5		1-452-032-00	MAGNET, DISC	
6		X-4039-650-1	COVER ASSY REAR (KV-HA21M50/HA21M80/	
			HA21M80/H/HA21M81) (■ 10 SCREWS)	
		X-4039-727-01	COVER ASSY REAR (■ 10 SCREWS)	
			(KV-HA21M60/HA21P52)	
7	*	3-704-372-11	HOLDER HV CABLE	
			(EXCEPT KV-HA21M80 (VIETNAM))	
	*	3-704-372-81	HOLDER HV CABLE	
			(KV-HA21M80 (VIETNAM))	
8		4-072-365-02	SPACER DY (KV-HA21M50)	
		4-072-600-11	SPACER DY (KV-HA21M80 (VIETNAM)/	
			HA21M80/H/HA21M81)	
		4-064-818-01	SPACER DY (KV-HA21M60/HA21P52)	
9		4-057-714-01	PIECE TLH CONVERGENCE	
10	⚠	8-451-505-11	DEFLECTION YOKE (Y21RSA-S)	
11	*	A-1332-200-A	CV BOARD MOUNTED (KV-HA21M50/	
			HA21M80(E)/HA21M80/H/HA21M81)	
	*	A-1332-245-A	CV BOARD MOUNTED	
			(KV-HA21P52/HA21M60)	
	*	A-1332-259-A	CV BOARD MOUNTED	
			(KV-HA21M80 (VIETNAM))	
12		4-057-862-01	SCREW, TAPPING 5 + CROWN WASHER	
13		4-078-765-01	SPRING EXTENSION (KV-HA21M50/	
			HA21M80/HA21M80/H/HA21M81)	
		4-078-765-11	SPRING EXTENSION	
			(KV-HA21M60/HA21P52)	
14	⚠	1-416-946-11	COIL DEMAGNETIC	
			(KV-HA21M50/HA21M80(E)/HA21M80/H	
			HA21M81)	
	⚠	1-419-479-11	COIL DEGAUSSING	
			(KV-HA21M60/HA21P52)	
	⚠	1-419-479-61	COIL DEGAUSSING	
			(KV-HA21M80 (VIETNAM))	
15		4-069-652-02	CUSHION (HS BAND) (KV-HA21M50/	
			HA21M80/HA21M80/H/HA21M81)	
		4-069-652-11	CUSHION (HS BAND)	
			(KV-HA21M60/HA21P52)	
16		4-034-272-21	PLATE CORRECTION TLV	
17		4-064-883-03	HOLDER DGC	
18		1-825-039-11	SPEAKER (15 × 6.5CM)	
			(EXCEPT KV-HA21M80(VIETNAM))	
		1-852-028-11	SPEAKER (15 × 6.5CM)	
			(KV-HA21M80(VIETNAM))	
19		4-051-736-42	PIECE A (90) CONV CORRECT	
20	*	A-1299-663-A	A BOARD COMPLETE	
			(KV-HA21M50/HA21M80(E))	
	*	A-1300-152-A	A BOARD COMPLETE (KV-HA21M60)	
	*	A-1299-649-A	A BOARD COMPLETE (KV-HA21M80/H)	
	*	A-1300-116-A	A BOARD COMPLETE (KV-HA21M81)	
	*	A-1300-093-A	A BOARD COMPLETE (KV-HA21P52)	
	*	A-1300-155-A	A BOARD COMPLETE	
			(KV-HA21M80(VIETNAM))	
21	⚠	1-453-329-21	TRANSFORMER ASSY FLY BACK	
			(NX-4751//M3A4)	
22		8-598-591-00	TUNER BT-AG402	
23		4-022-115-00	HOLDER AC CORD (KV-HA21M50/	
			HA21M80/HA21M80/H/HA21M81)	
		4-022-115-21	HOLDER AC CORD	
			(KV-HA21M60/HA21P52)	
24	*	4-083-951-01	BRACKET TERMINAL (KV-HA21M50/	
			HA21M80/HA21M80/H/HA21M81)	
	*	4-085-904-01	BRACKET TERMINAL	
			(KV-HA21M60/HA21P52)	
25	⚠	1-790-127-11	CORD AC POWER WITH CONNECTOR	
			(KV-HA21M80(VIETNAM))	
	⚠	1-823-551-11	CORD AC POWER WITH CONNECTOR	
			(KV-HA21M50/HA21M80(E)/HA21M80/H/	
			HA21M81)	
	⚠	1-575-023-41	CORD POWER WITH CONNECTOR	
			(KV-HA21M60/HA21P52)	
26	*	4-083-944-01	BAR OPTICAL (KV-HA21M50/HA21M80/	
			HA21M80/H/HA21M81)	
	*	4-085-903-01	BAR OPTICAL (KV-HA21M60/HA21P52)	
27		4-036-405-11	SPRING COMPRESSION (KV-HA21M50/	
			HA21M80/HA21M80/H/HA21M81)	
		4-036-405-21	SPRING COMPRESSION	
			(KV-HA21M60/HA21P52)	
28	*	4-046-981-01	BRACKET SPEAKER	
29		4-302-404-03	SCREW (WASHER HEAD) (+P 4X16)	
30		4-374-745-21	CUSHION (A)	
31		1-452-728-41	COIL NA ROTATION (RT-154)	
			(KV-HA21M50 ONLY)	
32	*	A-1342-630-A	V2 BOARD MOUNTED (KV-HA21M81)	
33	*	A-1400-242-A	A3 BOARD MOUNTED (KV-HA21M60)	
34	*	4-085-490-01	BRACKET PWB (KV-HA21M60/HA21P52)	
35	*	4-069-797-01	CUSHION SPEAKER (S)	
			(EXCEPT KV-HA21M60/HA21P52)	

SECTION 7
ELECTRICAL PARTS LIST

A

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All resistors are in ohms
- F : nonflammable

CAPACITORS
- MF : µF, PF : µµF

COILS
- MMH : mH, UH : µH

REF NO.	PART NO.	DESCRIPTION	REMARK
	* A-1299-663-A	A BOARD COMPLETE (KV-HA21M50/HA21M80(E))	
	* A-1300-152-A	A BOARD COMPLETE (KV-HA21M60)	
	* A-1300-155-A	A BOARD COMPLETE (KV-HA21M80(VIETNAM))	
	* A-1299-649-A	A BOARD COMPLETE (KV-HA21M80/H)	
	* A-1300-116-A	A BOARD COMPLETE (KV-HA21M81)	
	* A-1300-093-A	A BOARD COMPLETE (KV-HA21P52)	
		**********	
	1-533-223-11	CLIP, FUSE	
	* 4-055-304-11	HOLDER, LED	
	4-082-405-01	HOLDER, FBT	
	4-382-854-01	SCREW (M3X8), P, SW (+)	
	4-382-854-11	SCREW (M3X10), P, SW (+)	
	4-382-854-21	SCREW (M3X14), P, SW (+)	
	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
		<CAPACITOR>	
C001	1-162-962-11	CERAMIC CHIP 470PF 10.00% 50V	
C002	1-162-962-11	CERAMIC CHIP 470PF 10.00% 50V	
C004	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C005	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C006	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C007	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C009	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C010	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C011	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C012	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C013	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C014	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C015	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C016	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C018	1-126-961-11	ELECT 2.2UF 20.00% 50V	
C019	1-162-962-11	CERAMIC CHIP 470PF 10.00% 50V	
C020	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C021	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C022	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C023	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C024	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C025	1-135-834-91	CERAMIC CHIP 2.2E+06PF 6.3V	
C026	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C027	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C028	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C029	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C030	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C031	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C032	1-162-965-11	CERAMIC CHIP 0.0015UF 10.00% 50V	
C033	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C034	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C035	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C036	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C036	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C037	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C038	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C039	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C039	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C041	1-162-924-11	CERAMIC CHIP 56PF 5.00% 50V	
C042	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C043	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C044	1-162-924-11	CERAMIC CHIP 56PF 5.00% 50V	
C045	1-126-962-11	ELECT 3.3UF 20.00% 50V	
C046	1-162-995-11	CERAMIC CHIP 0.022UF 50V	
C047	1-113-619-11	CERAMIC CHIP 0.47UF 10V	
C048	1-126-965-91	ELECT 22UF 20.00% 50V	
C049	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C049	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C050	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C051	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C051	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C052	1-126-935-11	ELECT 470UF 20.00% 10V	
C053	1-126-935-11	ELECT 470UF 20.00% 10V	
C054	1-126-969-11	ELECT 220UF 20.00% 50V	
C055	1-162-960-11	CERAMIC CHIP 220PF 10.00% 50V	
C056	1-162-927-11	CERAMIC CHIP 100PF 5.00% 50V	
C057	1-162-960-11	CERAMIC CHIP 220PF 10.00% 50V	
C058	1-162-960-11	CERAMIC CHIP 220PF 10.00% 50V	
C061	1-162-966-11	CERAMIC CHIP 0.0022UF 10.00% 50V	
C063	1-162-923-11	CERAMIC CHIP 47PF 5.00% 50V	
C064	1-126-947-11	ELECT 47UF 20.00% 16V	
C100	1-162-964-11	CERAMIC CHIP 0.001UF 10.00% 50V	
C101	1-126-964-11	ELECT 10UF 20.00% 50V	
C102	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C102	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C103	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C103	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C104	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	
C104	1-163-038-91	CERAMIC CHIP 0.1UF 25V (EXCEPT KV-HA21M60/HA21P52)	
C105	1-164-360-11	CERAMIC CHIP 0.1UF 16V (KV-HA21M60/HA21P52)	

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REF NO.	PART NO.	DESCRIPTION			REMARK
C105	1-163-038-91	CERAMIC CHIP	0.1UF		25V
		(EXCEPT KV-HA21M60/HA21P52)			
C106	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C107	1-126-935-11	ELECT	470UF	20.00%	16V
C108	1-126-767-11	ELECT	1000UF	20.00%	16V
C109	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C110	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
		(KV-HA21M50/HA21M60/HA21M80(E))			
C111	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C112	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
		(KV-HA21M50/HA21M60/HA21M80(E))			
C113	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M50/HA21M60/HA21M80(E))			
C115	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C116	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C117	1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
C121	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C122	1-162-915-11	CERAMIC CHIP	10PF	0.50PF	50V
C124	1-130-493-00	MYLAR	0.068UF	5.00%	50V
C125	1-130-495-00	MYLAR	0.1UF	5.00%	50V
C126	1-130-493-00	MYLAR	0.068UF	5.00%	50V
C127	1-162-927-11	CERAMIC CHIP	100PF	5.00%	50V
C128	1-126-965-91	ELECT	22UF	20.00%	50V
C129	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C131	1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C200	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	25V
		(KV-HA21M60/HA21M80(VIETNAM)/HA21P52)			
C200	1-163-037-11	CERAMIC CHIP	0.022UF	10.00%	50V
		(EXCEPT KV-HA21M60/HA21M80(VIETNAM)/ HA21P52)			
C201	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	25V
		(KV-HA21M60/HA21M80(VIETNAM)/HA21P52)			
C201	1-163-037-11	CERAMIC CHIP	0.022UF	10.00%	50V
		(EXCEPT KV-HA21M60/HA21M80(VIETNAM)/ HA21P52)			
C202	1-130-471-00	MYLAR	0.001UF	5.00%	50V
C203	1-126-961-11	ELECT	2.2UF	20.00%	50V
C204	1-130-471-00	MYLAR	0.001UF	5.00%	50V
C205	1-126-961-11	ELECT	2.2UF	20.00%	50V
C206	1-126-968-11	ELECT	100UF	20.00%	50V
C207	1-126-942-61	ELECT	1000UF	20.00%	25V
C208	1-128-551-11	ELECT	22UF	20.00%	25V
C209	1-126-942-61	ELECT	1000UF	20.00%	25V
C210	1-128-551-11	ELECT	22UF	20.00%	25V
C211	1-126-959-11	ELECT	0.47UF	20.00%	50V
C213	1-162-970-11	CERAMIC CHIP	0.01UF	10.00%	25V
C214	1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C215	1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C216	1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C217	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	16V
C218	1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C219	1-104-509-11	CERAMIC CHIP	0.018UF	10.00%	16V
C220	1-164-227-11	CERAMIC CHIP	0.022UF	10.00%	16V
C221	1-162-967-11	CERAMIC CHIP	0.0033UF	10.00%	50V
		(KV-HA21M60/HA21P52)			
C221	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(EXCEPT KV-HA21M60/HA21P52)			
C222	1-104-509-11	CERAMIC CHIP	0.018UF	10.00%	16V
C223	1-162-967-11	CERAMIC CHIP	0.0033UF	10.00%	50V
		(KV-HA21M60/HA21P52)			
C223	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(EXCEPT KV-HA21M60/HA21P52)			
C224	1-126-960-11	ELECT	1UF	20.00%	50V
C225	1-126-960-11	ELECT	1UF	20.00%	50V

REF NO.	PART NO.	DESCRIPTION			REMARK
C226	1-126-963-11	ELECT	4.7UF	20.00%	50V
C227	1-126-947-11	ELECT	47UF	20.00%	16V
C228	1-126-960-11	ELECT	1UF	20.00%	50V
C229	1-126-959-11	ELECT	0.47UF	20.00%	50V
C230	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C231	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C232	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C234	1-125-891-11	CERAMIC CHIP	0.47UF	10.00%	10V
		(KV-HA21M60/HA21P52)			
C234	1-107-823-11	CERAMIC CHIP	0.47UF	10.00%	16V
		(EXCEPT KV-HA21M60/HA21P52)			
C236	1-126-960-11	ELECT	1UF	20.00%	50V
		(KV-HA21M50/HA21M60/HA21M80(E)/ HA21P52)			
C236	1-130-491-00	MYLAR	0.047UF	5.00%	50V
		(KV-HA21M80(VIETNAM)/ KV-HA21M80/H/HA21M81)			
C237	1-126-951-11	ELECT	470UF	20.00%	35V
C240	1-135-834-91	CERAMIC CHIP	2.2E+06PF		6.3V
C241	1-162-967-11	CERAMIC CHIP	0.0033UF	10.00%	50V
		(KV-HA21M60/HA21P52)			
C241	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
		(KV-HA21M50/HA21M80(E)/ HA21M80(VIETNAM))			
C241	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KVHA21M80/H/HA21M81)			
C242	1-162-967-11	CERAMIC CHIP	0.0033UF	10.00%	50V
		(KV-HA21M60/HA21M80/H/HA21P52/ HA21M81)			
C242	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
		(KV-HA21M80 (VIETNAM))			
C242	1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
		(KV-HA21M50/HA21M80(E))			
C243	1-126-952-11	ELECT	1000UF	20.00%	35V
C300	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(EXCEPT KV-HA21M60/HA21P52)			
C300	1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
		(KV-HA21P52)			
C301	1-162-920-11	CERAMIC CHIP	27PF	5.00%	50V
C302	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(EXCEPT KV-HA21P52)			
C303	1-162-925-11	CERAMIC CHIP	68PF	5.00%	50V
		(EXCEPT KV-HA21P52)			
C304	1-119-662-91	CERAMIC CHIP	150PF	1.00%	50V
C305	1-126-933-11	ELECT	100UF	20.00%	16V
C306	1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C308	1-163-131-00	CERAMIC CHIP	390PF	5.00%	50V
		(EXCEPT KV-HA21M60)			
C308	1-216-864-11	SHORT	0 (KV-HA21M60)		
C309	1-216-864-11	SHORT	0 (KV-HA21M60)		
C309	1-163-263-11	CERAMIC CHIP	330PF	5.00%	50V
		(EXCEPT KV-HA21M60/HA21P52)			
C310	1-216-864-11	SHORT	0 (KV-HA21M60)		
C310	1-163-131-00	CERAMIC CHIP	390PF	5.00%	50V
		(EXCEPT KV-HA21M60)			
C311	1-216-864-11	SHORT	0 (KV-HA21M60)		
C311	1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
		(KV-HA21M50/HA21M80(E)/HA21M80/H/ HA21M81/HA21M80(VIETNAM)			
C312	1-162-916-11	CERAMIC CHIP	12PF	5.00%	50V
C315	1-126-961-11	ELECT	2.2UF	20.00%	50V
C316	1-162-923-11	CERAMIC CHIP	47PF	5.00%	50V
		(EXCEPT KV-HA21P52)			
C317	1-216-864-11	SHORT	0		
C318	1-164-360-11	CERAMIC CHIP	0.1UF		16V
		(KV-HA21M60/HA21P52)			

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REF NO.	PART NO.	DESCRIPTION	REMARK
C318	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C319	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C319	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C320	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C320	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C321	1-126-963-11	ELECT 4.7UF 20.00%	50V
C323	1-162-927-11	CERAMIC CHIP 100PF 5.00%	50V
C327	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C327	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C328	1-165-128-11	CERAMIC CHIP 0.22UF	16V
		(KV-HA21M60/HA21P52)	
C328	1-164-222-91	CERAMIC CHIP 0.22UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C329	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C329	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C330	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C330	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C332	1-126-933-11	ELECT 100UF 20.00%	16V
C335	1-126-947-11	ELECT 47UF 20.00%	16V
C337	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C337	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C339	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C339	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C342	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C342	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C343	1-162-917-11	CERAMIC CHIP 15PF 5.00%	50V
C344	1-162-917-11	CERAMIC CHIP 15PF 5.00%	50V
C345	1-162-967-11	CERAMIC CHIP 0.0033UF 10.00%	50V
C346	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C346	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C347	1-126-933-11	ELECT 100UF 20.00%	16V
C348	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C348	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C349	1-164-346-11	CERAMIC CHIP 1UF	16V
C352	1-162-966-11	CERAMIC CHIP 0.0022UF 10.00%	50V
C353	1-125-891-11	CERAMIC CHIP 0.47UF 10.00%	10V
		(KV-HA21M60/HA21P52)	
C353	1-107-823-11	CERAMIC CHIP 0.47UF 10.00%	16V
		(EXCEPT KV-HA21M60/HA21P52)	
C354	1-162-968-11	CERAMIC CHIP 0.0047UF 10.00%	50V
C355	1-125-891-11	CERAMIC CHIP 0.47UF 10.00%	10V
		(KV-HA21M60/HA21P52)	
C355	1-107-823-11	CERAMIC CHIP 0.47UF 10.00%	16V
		(EXCEPT KV-HA21M60/HA21P52)	
C356	1-162-970-11	CERAMIC CHIP 0.01UF 10.00%	25V

REF NO.	PART NO.	DESCRIPTION	REMARK
C357	1-162-964-11	CERAMIC CHIP 0.001UF 10.00%	50V
C358	1-162-927-11	CERAMIC CHIP 100PF 5.00%	50V
C359	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C359	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C360	1-130-495-00	MYLAR 0.1UF 5.00%	50V
C361	1-135-834-91	CERAMIC CHIP 2.2E+06PF 6.3V	
C362	1-113-619-11	CERAMIC CHIP 0.47UF	10V
C363	1-162-968-11	CERAMIC CHIP 0.0047UF 10.00%	50V
		(EXCEPT KV-HA21M60)	
C364	1-126-964-11	ELECT 10UF 20.00%	50V
C366	1-126-933-11	ELECT 100UF 20.00%	16V
C369	1-137-194-81	FILM 0.47UF 5.00%	50V
		(EXCEPT KV-HA21M80(VIETNAM))	
C370	1-216-295-91	SHORT 0	
		(EXCEPT KV-HA21M60/HA21P52)	
C371	1-126-964-11	ELECT 10UF 20.00%	50V
		(EXCEPT KV-HA21M80(VIETNAM))	
C400	1-126-934-11	ELECT 220UF 20.00%	16V
C403	1-115-156-11	CERAMIC CHIP 1UF	10V
C404	1-126-960-11	ELECT 1UF 20.00%	50V
C405	1-126-960-11	ELECT 1UF 20.00%	50V
C406	1-115-156-11	CERAMIC CHIP 1UF	10V
C407	1-126-934-11	ELECT 220UF 20.00%	16V
C408	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C408	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C409	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C409	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C410	1-126-933-11	ELECT 100UF 20.00%	16V
C411	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C411	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C412	1-128-551-11	ELECT 22UF 20.00%	25V
C414	1-164-360-11	CERAMIC CHIP 0.1UF	16V
		(KV-HA21M60/HA21P52)	
C414	1-163-038-91	CERAMIC CHIP 0.1UF	25V
		(EXCEPT KV-HA21M60/HA21P52)	
C418	1-126-933-11	ELECT 100UF 20.00%	16V
C424	1-126-964-11	ELECT 10UF 20.00%	50V
		(KV-HA21M81)	
C425	1-109-864-91	CERAMIC CHIP 68PF 2.00%	50V
C426	1-109-864-91	CERAMIC CHIP 68PF 2.00%	50V
C435	1-126-934-11	ELECT 220UF 20.00%	16V
C500	1-126-933-11	ELECT 100UF 20.00%	16V
C501	1-104-666-11	ELECT 220UF 20.00%	25V
C502	1-104-666-11	ELECT 220UF 20.00%	25V
C503	1-162-318-11	CERAMIC 0.001UF 10.00%	500V
C504	1-162-318-11	CERAMIC 0.001UF 10.00%	500V
C505	1-123-024-21	ELECT 33UF	160V
C507	1-102-228-00	CERAMIC 470PF 10.00%	500V
C508	1-107-654-11	ELECT 33UF 20.00%	250V
C509	1-106-379-12	MYLAR 0.033UF 10.00%	200V
C510	1-137-150-11	MYLAR 0.01UF 10.00%	100V
C520	1-126-964-11	ELECT 10UF 20.00%	50V
		(EXCEPT KV-HA21M80/H/	
		HA21M80(VIETNAM)/HA21P52)	
C521	1-126-964-11	ELECT 10UF 20.00%	50V
		(EXCEPT KV-HA21M80/H/	
		HA21M80(VIETNAM)/HA21P52)	

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A

REF NO.		PART NO.	DESCRIPTION		REMARK	
C552		1-137-194-81	FILM	0.47UF	5.00%	50V
C554		1-164-361-11	CERAMIC CHIP (KV-HA21M60/HA21P52)	0.047UF		25V
C554		1-163-035-00	CERAMIC CHIP (EXCEPT KV-HA21M60/HA21P52)	0.047UF		50V
C555		1-126-949-11	ELECT	220UF	20.00%	35V
C556		1-164-360-11	CERAMIC CHIP (KV-HA21M60/HA21P52)	0.1UF		16V
C556		1-163-038-91	CERAMIC CHIP (EXCEPT KV-HA21M60/HA21P52)	0.1UF		25V
C557		1-126-948-11	ELECT	100UF	20.00%	35V
C558		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C559		1-106-220-00	MYLAR	0.1UF	10.00%	100V
C561		1-162-968-11	CERAMIC CHIP	0.0047UF	10.00%	50V
C562		1-106-220-00	MYLAR	0.1UF	10.00%	100V
C600		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C601	⚠	1-115-165-11	FILM	0.1UF	20.00%	275V
C602		1-117-752-11	ELECT(BLOCK)	330UF	20.00%	450V
C603		1-117-623-11	FILM	1500PF	3.00%	1.2KV
C604		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C605		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C606		1-104-666-11	ELECT	220UF	20.00%	25V
C607		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C608		1-161-830-00	CERAMIC	0.0047UF	99%	500V
C609		1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C610		1-165-740-31	ELECT	150UF	20%	35V
C611		1-163-145-00	CERAMIC CHIP	0.0015UF	5.00%	50V
C612	⚠	1-119-886-51	CERAMIC	470PF	10.00%	250V
C613		1-102-228-00	CERAMIC	470PF	10.00%	500V
C614		1-123-024-21	ELECT	33UF		160V
C615		1-102-228-00	CERAMIC	470PF	10.00%	500V
C617		1-126-942-61	ELECT	1000UF	20.00%	25V
C618		1-126-933-11	ELECT	100UF	20.00%	16V
C619	⚠	1-119-886-51	CERAMIC	470PF	10.00%	250V
C620		1-162-134-11	CERAMIC	470PF	10.00%	2KV
C621		1-117-703-11	CERAMIC	0.0047UF	99%	250V
C626		1-106-383-00	MYLAR	0.047UF	10.00%	200V
C627		1-126-953-11	ELECT	2200UF	20.00%	35V
C628		1-162-962-11	CERAMIC CHIP	470PF	10.00%	50V
C800		1-126-960-11	ELECT	1UF	20.00%	50V
C801		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C802		1-106-375-12	MYLAR	0.022UF	99%	200V
C803		1-102-244-00	CERAMIC	220PF	10.00%	500V
C804		1-162-318-11	CERAMIC	0.001UF	10.00%	500V
C807		1-162-115-00	CERAMIC	330PF	10.00%	2KV
C808		1-106-365-00	MYLAR	0.0082UF	10.00%	200V
C809		1-107-364-11	MYLAR	0.01UF	10.00%	200V
C810		1-106-375-12	MYLAR	0.022UF	99%	200V
C811		1-107-957-11	ELECT	1UF	20.00%	250V
C812		1-117-665-11	FILM	0.33UF	5.00%	250V
C813		1-162-115-00	CERAMIC	330PF	10.00%	2KV
C814		1-117-646-11	FILM	12000PF	3.00%	1.2KV
C852		1-107-846-11	FILM	0.1UF	5.00%	250V
C856		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C857		1-126-964-11	ELECT	10UF	20.00%	50V
C858		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C859		1-162-974-11	CERAMIC CHIP	0.01UF		50V
C860		1-218-899-11	METAL CHIP	150K	0.5%	1/16W
C861		1-130-202-00	FILM	0.022UF	5.00%	400V
C863		1-216-864-11	SHORT	0		
C865		1-126-933-11	ELECT	100UF	20.00%	16V

REF NO.	PART NO.	DESCRIPTION		REMARK	
C866	1-162-974-11	CERAMIC CHIP	0.01UF		50V
C867	1-162-966-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C868	1-162-995-11	CERAMIC CHIP	0.022UF		50V
C869	1-164-156-11	CERAMIC CHIP (KV-HA21M60/HA21P52)	0.1UF		25V
C869	1-115-339-11	CERAMIC CHIP (EXCEPT KV-HA21M60/HA21P52)	0.1UF	10.00%	50V
C870	1-162-960-11	CERAMIC CHIP	220PF	10.00%	50V
C872	1-164-360-11	CERAMIC CHIP (KV-HA21M60/HA21P52)	0.1UF		16V
C872	1-163-038-91	CERAMIC CHIP (EXCEPT KV-HA21M60/HA21P52)	0.1UF		25V
C873	1-162-974-11	CERAMIC CHIP	0.01UF		50V
C874	1-162-974-11	CERAMIC CHIP	0.01UF		50V
C875	1-164-360-11	CERAMIC CHIP (KV-HA21M60/HA21P52)	0.1UF		16V
C875	1-163-038-91	CERAMIC CHIP (EXCEPT KV-HA21M60/HA21P52)	0.1UF		25V
		<FILTER>			
CF345	1-234-684-21	FILTER, BAND PASS (F4.5C) (EXCEPT KV-HA21M60/HA21P52)			
CF355	1-234-686-21	FILTER, BAND PASS (F5.5C) (EXCEPT KV-HA21M60)			
CF360	1-234-689-21	FILTER, BAND PASS (F6.0C) (EXCEPT KV-HA21M60/HA21P52)			
CF365	1-234-691-21	FILTER, BAND PASS (F6.5C) (EXCEPT KV-HA21M60/HA21P52)			
CF365	1-234-693-21	FILTER, BAND PASS (F5.74B) (KV-HA21P52)			
		<######### >			
CLP001	4-352-844-01	PIN, LEAD, COATING			
CLP003	4-352-844-01	PIN, LEAD, COATING			
		<CONNECTOR>			
CN001	* 1-774-813-11	CONNECTOR, BOARD TO BOARD 7P (KV-HA21M81)			
CN002	* 1-774-813-11	CONNECTOR, BOARD TO BOARD 7P (KV-HA21M81)			
CN003	* 1-508-797-00	PIN, CONNECTOR 4P			
CN200	* 1-564-507-11	PLUG, CONNECTOR 4P			
CN300	* 1-564-509-11	PLUG, CONNECTOR 6P			
CN301	* 1-774-813-11	CONNECTOR, BOARD TO BOARD 7P (KV-HA21M60)			
CN302	* 1-774-813-11	CONNECTOR, BOARD TO BOARD 7P (KV-HA21M60)			
CN500	* 1-564-508-11	PLUG, CONNECTOR 5P			
CN501	* 1-564-506-11	PLUG, CONNECTOR 3P (KV-HA21M50/HA21M80/HA21M80/H/ HA21M81)			
CN520	* 1-564-506-11	PLUG, CONNECTOR 3P (EXCEPT KV-HA21M80(VIETNAM)/ HA21M80/H/HA21P52)			
CN600	* 1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P (EXCEPT KV-HA21M60/HA21P52)			
CN601	* 1-691-134-11	PIN, CONNECTOR (PC BOARD) 2P (KV-HA21M50/HA21M80(E)/ HA21M80(VIETNAM)			
CN601	* 1-573-963-11	PIN, CONNECTOR (PC BOARD) 3P (EXCEPT KV-HA21M50/HA21M80(E)/ HA21M80(VIETNAM))			
CN602	1-580-843-11	PIN, CONNECTOR (POWER)			

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REF NO.	PART NO.	DESCRIPTION	REMARK
		<TRIMMER>	
CT131	1-767-774-22	TRAP, CERAMIC (EXCEPT HA21M80/H/HA21M81)	
CT139	1-767-775-22	TRAP, CERAMIC	
CT345	1-795-342-21	TRAP, CERAMIC (T4.5C) (EXCEPT HA21P52)	
CT355	1-795-343-21	TRAP, CERAMIC (T55B)	
CT360	1-795-344-21	TRAP, CERAMIC (T60B) (EXCEPT HA21P52)	
CT365	1-795-345-21	TRAP, CERAMIC (T65B) (EXCEPT HA21P52)	
CT365	1-795-343-21	TRAP, CERAMIC (T55B) (KV-HA21P52)	
		<DIODE>	
D001	8-719-083-18	DIODE SPB-25MVWF	
D004	8-719-911-19	1SS119-25	
D005	8-719-109-89	RD5.6ESB2 (EXCEPT KV-HA21M80(VIETNAM))	
D005	8-719-109-84	RD5.1ES-B1 (KV-HA21M80(VIETNAM))	
D006	8-719-109-89	RD5.6ESB2 (EXCEPT KV-HA21M80(VIETNAM))	
D007	8-719-069-54	UDZSTE-175.1B (KV-HA21M60/HA21P52)	
D007	8-719-159-10	RD5.1SB-T2 (EXCEPT KV-HA21M60/HA21P52)	
D009	8-719-069-54	UDZSTE-175.1B (KV-HA21M60/HA21P52)	
D009	8-719-159-10	RD5.1SB-T2 (EXCEPT KV-HA21M60/HA21P52)	
D100	8-719-421-40	MA77 (EXCEPT KV-HA21P52)	
D103	8-759-157-40	UPC574J	
D104	8-719-914-42	DA204K	
D200	8-719-914-42	DA204K	
D202	8-719-988-61	1SS355TE-17	
D203	8-719-988-61	1SS355TE-17	
D301	8-719-988-61	1SS355TE-17 (EXCEPT KV-HA21P52)	
D304	8-719-063-66	HZS361-TE	
D305	8-719-988-61	1SS355TE-17	
D306	8-719-109-54	RD2.2ES-B2	
D307	8-719-988-61	1SS355TE-17	
D308	8-719-988-61	1SS355TE-17	
D309	8-719-069-60	UDZSTE-179.1B	
D310	8-719-911-19	1SS119-25	
D311	8-719-070-15	NNCD8.2A-T1	
D312	8-719-069-60	UDZSTE-179.1B	
D314	8-719-908-03	GP08D	
D315	8-719-988-61	1SS355TE-17	
D316	8-719-109-89	RD5.6ESB2 (KV-HA21M81)	
D318	8-719-988-61	1SS355TE-17	
D319	8-719-988-61	1SS355TE-17	
D320	8-719-988-61	1SS355TE-17	
D321	8-719-988-61	1SS355TE-17	
D322	8-719-069-60	UDZSTE-179.1B	
D323	8-719-069-60	UDZSTE-179.1B	
D324	8-719-069-60	UDZSTE-179.1B	
D325	8-719-069-60	UDZSTE-179.1B	
D327	8-719-988-61	1SS355TE-17	
D400	8-719-988-61	1SS355TE-17	
D401	8-719-988-61	1SS355TE-17	
D402	8-719-070-16	NNCD9.1A-T1	
D403	8-719-069-60	UDZSTE-179.1B	
D404	8-719-069-60	UDZSTE-179.1B	
D405	8-719-070-16	NNCD9.1A-T1	
D406	8-719-069-60	UDZSTE-179.1B	
D407	8-719-069-60	UDZSTE-179.1B	
D500	8-719-911-19	1SS119-25	
D501	8-719-911-19	1SS119-25	
D502	8-719-302-43	EL1Z	
D503	8-719-302-43	EL1Z	
D504	8-719-302-43	EL1Z	
D520	8-719-911-19	1SS119-25 (EXCEPT KV-HA21M80/H/ HA21M80(VIETNAM)/HA21P52)	
D521	8-719-911-19	1SS119-25 (EXCEPT KV-HA21M80/H/ HA21M80(VIETNAM)/HA21P52)	
D552	8-719-908-03	GP08D	
D553	8-719-109-89	RD5.6ESB2	
D600	8-719-030-33	DIODE EG01CV1	
D601	8-719-077-77	D3SB60F3	
D602	8-719-510-73	S3L20UF4	
D603	8-719-110-39	RD15ES-B1	
D604	8-719-063-70	D1NL20U	
D605	8-719-063-70	D1NL20U	
D606	8-719-063-70	D1NL20U	
D607	8-719-027-22	D3S6M-F	
D608	8-719-312-10	RU4AM-T3	
D609	8-719-067-18	RN4Z	
D800	8-719-911-19	1SS119-25	
D802	8-719-908-03	GP08D	
D803	8-719-908-03	GP08D	
D804	8-719-081-00	DIODE BY228/A52A/	
D805	8-719-069-60	UDZSTE-179.1B	
D851	8-719-979-85	EGP20G	
D853	8-719-988-61	1SS355TE-17	
D854	8-719-158-53	RD13SB2	
		<CONNECTOR>	
DY1	* 1-580-798-11	CONNECTOR PIN (DY) 6P	
		<FUSE>	
F600	⚠ 1-532-237-00	FUSE, TIME-LAG (BET) 3.15A/250V	
		<FERRITE BEAD>	
FB001	1-410-397-21	FERRITE 1.1UH	
FB100	1-239-358-21	FILTER, NOISE	
FB601	1-410-397-21	FERRITE 1.1UH (KV-HA21M80(VIETNAM))	
FB603	1-412-911-31	FERRITE 0UH	
FB604	1-410-397-21	FERRITE 1.1UH	
FB800	1-410-397-21	FERRITE 1.1UH	
		<IC>	
IC001	8-752-925-65	IC CXP85224A-080S (KV-HA21M80/H/HA21M81)	
IC001	8-752-925-66	IC CXP85224A-081S (KV-HA21M60/HA21P52)	
IC001	8-752-925-67	IC CXP85224A-082S (KV-HA21M80(VIETNAM))	
IC001	8-752-928-47	IC CXP85224A-085S (KV-HA21M50/HA21M80(E))	
IC002	8-759-371-21	MM1319AFBE	
IC003	8-759-672-78	M24C08-BN6(A)	
IC004	8-742-225-20	IC SBX3081-21	

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REF NO.	PART NO.	DESCRIPTION	REMARK
IC201	8-759-476-86	TDA7438D013TR	
IC203	6-700-034-01	IC AN5276	
IC301	6-700-146-01	IC TDA8844/N2 (EXCEPT KV-HA21P52)	
IC301	6-700-145-01	IC TDA8843/N2 (KV-HA21P52)	
IC402	8-759-649-89	IC MC4558CD	
IC520	8-759-356-16	NJM4556AD (EXCEPT KV-HA21M80/H/ HA21M80(VIETNAM)/HA21P52)	
IC551	8-759-835-98	IC AN5522	
IC601	8-749-019-42	IC STR-F6707A	
IC602	8-749-920-61	SE-135N	
IC604	8-759-544-13	IC KA78R09TU (KV-HA21M60/HA21M80(VIETNAM)/ HA21P52)	
IC604	8-759-459-99	PQ09RD11 (EXCEPT KV-HA21M60/ HA21M80(VIETNAM)/HA21P52)	
IC850	8-759-700-07	NJM2903M	
IC851	8-759-649-89	IC MC4558CD	
		<JACK>	
J200	1-770-786-11	JACK	
J400	1-779-850-11	JACK BLOCK, PIN 6P	
J401	1-770-329-11	JACK, PIN 3P	
		<CHIP CONDUCTOR>	
JR001	1-216-864-11	SHORT 0	
JR003	1-216-864-11	SHORT 0	
JR006	1-216-864-11	SHORT 0	
JR007	1-216-295-91	SHORT 0 (KV-HA21M81)	
JR013	1-216-864-11	SHORT 0	
JR014	1-216-864-11	SHORT 0	
JR015	1-216-864-11	SHORT 0	
JR016	1-216-864-11	SHORT 0	
JR018	1-216-864-11	SHORT 0	
JR020	1-216-864-11	SHORT 0	
JR030	1-216-864-11	SHORT 0 (EXCEPT KV-HA21M80(VIETNAM)/ HA21M80/H/HA21P52)	
JR033	1-216-295-91	SHORT 0 (KV-HA21M80(VIETNAM)/HA21M80/H/ HA21M81)	
JR034	1-216-864-11	SHORT 0 (EXCEPT KV-HA21P52)	
JR035	1-216-864-11	SHORT 0	
JR036	1-216-864-11	SHORT 0	
JR100	1-216-864-11	SHORT 0 (KV-HA21P52)	
JR205	1-216-295-91	SHORT 0 (EXCEPT KV-HA21P52)	
JR206	1-110-563-11	CERAMIC CHIP 0.068UF 10.00% 16V (KV-HA21M80/H/HA21M81)	
JR210	1-216-864-11	SHORT 0	
JR212	1-216-864-11	SHORT 0	
JR214	1-216-864-11	SHORT 0	
JR301	1-216-864-11	SHORT 0 (EXCEPT KV-HA21P52)	
JR304	1-216-864-11	SHORT 0	
JR400	1-216-864-11	SHORT 0	
		<COIL>	
L001	1-414-855-31	INDUCTOR 1UH	
L002	1-414-184-41	INDUCTOR 15UH	
L100	1-414-856-11	INDUCTOR 10UH	
L101	1-410-498-11	INDUCTOR 1.2UH	
L102	1-410-985-42	INDUCTOR 0.22UH	
L103	1-410-987-42	INDUCTOR 0.33UH	
L200	1-249-403-11	CARBON 68 5% 1/4W (EXCEPT KV-HA21M81/HA21P52)	
L200	1-249-401-11	CARBON 47 5% 1/4W (KV-HA21M81/HA21P52)	
L300	1-410-511-11	INDUCTOR 15UH (KV-HA21P52)	
L300	1-410-513-11	INDUCTOR 22UH (KV-HA21M60)	
L300	1-410-512-11	INDUCTOR 18UH (EXCEPT KV-HA21M60/HA21P52)	
L301	1-410-510-11	INDUCTOR 12UH (EXCEPT KV-HA21P52)	
L302	1-410-508-11	INDUCTOR 8.2UH (EXCEPT KV-HA21P52)	
L303	1-410-508-11	INDUCTOR 8.2UH (EXCEPT KV-HA21P52)	
L304	1-410-510-11	INDUCTOR 12UH	
L305	1-410-510-11	INDUCTOR 12UH	
L306	1-410-500-11	INDUCTOR 1.8UH (EXCEPT KV-HA21M60/HA21P52)	
L306	1-410-501-11	INDUCTOR 2.2UH (KV-HA21P52)	
L307	1-410-501-11	INDUCTOR 2.2UH (EXCEPT KV-HA21M60/HA21P52)	
L308	1-410-501-11	INDUCTOR 2.2UH (EXCEPT KV-HA21M60)	
L309	1-410-502-11	INDUCTOR 2.7UH (EXCEPT KV-HA21M60/HA21P52)	
L310	1-408-608-31	INDUCTOR 27UH (EXCEPT KV-HA21P52)	
L400	1-414-187-11	INDUCTOR 47UH	
L500	1-408-947-00	INDUCTOR 2.2MH	
L600	1-412-533-21	INDUCTOR 47UH	
L601	1-414-487-41	INDUCTOR 1UH (EXCEPT KV-HA21M80(VIETNAM))	
L800	1-406-677-11	INDUCTOR 10MH	
L802	1-424-796-11	COIL, HORIZONTAL LINEARITY	
L803	1-414-493-41	INDUCTOR 4.7MH	
		<PHOTO COUPLER>	
PH600	⚠ 8-749-924-35	ON3171-R (KV-HA21M60/HA21P52)	
PH600	⚠ 8-749-010-64	PC123F2 (EXCEPT KV-HA21M60/HA21P52)	
		<IC LINK>	
PS600	1-533-597-41	LINK, IC	
PS601	1-533-597-41	LINK, IC	
		<TRANSISTOR>	
Q001	8-729-421-19	UN2213	
Q002	8-729-421-19	UN2213	
Q003	8-729-010-25	MSD601-RT1	
Q004	8-729-010-25	MSD601-RT1	
Q005	8-729-421-19	UN2213 (KV-HA21M60/HA21M80/H/HA21P52)	
Q005	8-729-010-25	MSD601-RT1 (KV-HA21M80(VIETNAM))	
Q100	8-729-010-25	MSD601-RT1	
Q101	8-729-010-25	MSD601-RT1 (KV-HA21M50/HA21M60/HA21M80(E))	
Q102	8-729-022-54	TRANSISTOR 2SC3779C,D-AA	
Q103	8-729-424-67	UN2216 (EXCEPT KV-HA21P52)	
Q104	8-729-424-67	UN2216 (EXCEPT KV-HA21P52)	
Q105	8-729-010-25	MSD601-RT1	
Q106	8-729-010-25	MSD601-RT1	
Q201	8-729-010-25	MSD601-RT1(EXCEPT KV-HA21M60)	
Q202	8-729-036-56	2SK208-GR-TE85L	

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REF NO.	PART NO.	DESCRIPTION	REMARK
Q203	8-729-010-25	MSD601-RT1	
Q204	8-729-216-22	2SA1162-G	
Q205	8-729-421-22	UN2211	
Q208	1-801-806-11	TR DTC144EKA	
Q300	8-729-010-05	MSB709-RT1 (EXCEPT KV-HA21P52)	
Q301	8-729-010-05	MSB709-RT1	
Q302	8-729-010-05	MSB709-RT1 (EXCEPT KV-HA21P52)	
Q303	8-729-010-25	MSD601-RT1	
Q304	8-729-010-05	MSB709-RT1	
Q305	8-729-010-05	MSB709-RT1	
Q306	8-729-010-25	MSD601-RT1	
Q307	8-729-010-25	MSD601-RT1 (EXCEPT KV-HA21P52)	
Q308	8-729-424-67	UN2216	
Q309	8-729-010-25	MSD601-RT1	
Q310	8-729-424-67	UN2216 (EXCEPT KV-HA21P52)	
Q311	8-729-010-25	MSD601-RT1(EXCEPT KV-HA21P52)	
Q312	8-729-424-67	UN2216	
Q313	8-729-424-67	UN2216 (EXCEPT KV-HA21P52)	
Q314	8-729-421-22	UN2211 (EXCEPT KV-HA21P52)	
Q315	8-729-010-25	MSD601-RT1	
Q318	8-729-010-25	MSD601-RT1 (KV-HA21M60)	
Q319	8-729-010-25	MSD601-RT1 (KV-HA21M81)	
Q320	8-729-421-22	UN2211	
Q400	8-729-010-05	MSB709-RT1	
Q401	8-729-424-67	UN2216	
Q402	8-729-424-67	UN2216	
Q403	8-729-010-05	MSB709-RT1	
Q404	8-729-010-05	MSB709-RT1	
Q405	8-729-010-05	MSB709-RT1	
Q406	8-729-010-25	MSD601-RT1	
Q407	8-729-010-25	MSD601-RT1	
Q500	8-729-200-17	2SA1091-O	
Q520	8-729-423-33	2SC3311A-QRSTA (KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)	
Q800	8-729-140-50	2SC3209LK	
Q801	8-729-055-74	TRANSISTOR 2SD2624-CA	
Q802	8-729-050-48	TRANSISTOR IRF614-005	
Q850	8-729-010-25	MSD601-RT1	
Q851	8-729-010-05	MSB709-RT1	
Q962	8-729-010-05	MSB709-RT1 (KV-HA21M50/HA21M80/HA21M80/H/ HA21M81)	

<RESISTOR>

REF NO.	PART NO.	DESCRIPTION			REMARK
R001	1-216-832-11	RES-CHIP	8.2K	5%	1/16W
R002	1-216-832-11	RES-CHIP	8.2K	5%	1/16W
R003	1-216-826-11	RES-CHIP	2.7K	5%	1/16W
R004	1-216-826-11	RES-CHIP	2.7K	5%	1/16W
R005	1-216-818-11	RES-CHIP	560	5%	1/16W
R006	1-216-818-11	RES-CHIP	560	5%	1/16W
R007	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R008	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R009	1-216-815-11	RES-CHIP	330	5%	1/16W
R010	1-216-815-11	RES-CHIP	330	5%	1/16W
R011	1-216-864-11	SHORT	0		
R012	1-216-821-11	RES-CHIP	1K	5%	1/16W
R013	1-216-807-11	RES-CHIP	68	5%	1/16W
R014	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R015	1-216-809-11	RES-CHIP	100	5%	1/16W
R016	1-216-815-11	RES-CHIP	330	5%	1/16W
R017	1-216-821-11	RES-CHIP	1K	5%	1/16W
R018	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R019	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R020	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R021	1-216-821-11	RES-CHIP (EXCEPT KV-HA21P52)	1K	5%	1/16W
R022	1-216-821-11	RES-CHIP	1K	5%	1/16W
R024	1-216-809-11	RES-CHIP	100	5%	1/16W
R025	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R026	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R027	1-216-847-11	RES-CHIP	150K	5%	1/16W
R028	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R029	1-216-809-11	RES-CHIP	100	5%	1/16W
R030	1-216-809-11	RES-CHIP (KV-HA21M60 ONLY)	100	5%	1/16W
R031	1-216-809-11	RES-CHIP	100	5%	1/16W
R032	1-216-821-11	RES-CHIP	1K	5%	1/16W
R033	1-216-833-11	RES-CHIP	10K	5%	1/16W
R034	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R035	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R036	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R037	1-216-821-11	RES-CHIP	1K	5%	1/16W
R038	1-216-821-11	RES-CHIP	1K	5%	1/16W
R039	1-216-818-11	RES-CHIP	560	5%	1/16W
R042	1-216-816-11	RES-CHIP	390	5%	1/16W
R043	1-216-809-11	RES-CHIP	100	5%	1/16W
R044	1-216-813-11	RES-CHIP	220	5%	1/16W
R045	1-216-833-11	RES-CHIP	10K	5%	1/16W
R046	1-218-881-11	METAL CHIP	27K	0.5%	1/10W
R047	1-216-809-11	RES-CHIP	100	5%	1/16W
R048	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R049	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R050	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R051	1-216-833-11	RES-CHIP	10K	5%	1/16W
R052	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R053	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R054	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R055	1-216-821-11	RES-CHIP	1K	5%	1/16W
R056	1-216-821-11	RES-CHIP	1K	5%	1/16W
R057	1-216-809-11	RES-CHIP	100	5%	1/16W
R058	1-216-809-11	RES-CHIP	100	5%	1/16W
R059	1-216-813-11	RES-CHIP	220	5%	1/16W
R060	1-216-813-11	RES-CHIP	220	5%	1/16W
R061	1-216-813-11	RES-CHIP	220	5%	1/16W
R062	1-216-821-11	RES-CHIP	1K	5%	1/16W
R063	1-216-821-11	RES-CHIP	1K	5%	1/16W
R064	1-216-821-11	RES-CHIP (EXCEPT KV-HA21P52)	1K	5%	1/16W
R065	1-216-821-11	RES-CHIP	1K	5%	1/16W
R066	1-216-821-11	RES-CHIP	1K	5%	1/16W
R069	1-216-821-11	RES-CHIP (KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)	1K	5%	1/16W
R070	1-216-829-11	RES-CHIP (KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)	4.7K	5%	1/16W
R072	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R073	1-216-081-00	RES-CHIP (KV-HA21M80/H/HA21M80(VIETNAM)/ HA21P52)	22K	5%	1/10W

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REF NO.	PART NO.	DESCRIPTION			REMARK
R074	1-216-821-11	RES-CHIP	1K	5%	1/16W
R076	1-216-025-11	RES-CHIP	100	5%	1/10W
		(KV-HA21M80/H/HA21M80(VIETNAM)/ HA21M81)			
R077	1-216-809-11	RES-CHIP	100	5%	1/16W
R100	1-216-821-11	RES-CHIP	1K	5%	1/16W
R101	1-216-828-11	RES-CHIP	3.9K	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E))			
R102	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E))			
R103	1-211-981-11	METAL CHIP	33	0.5%	1/10W
R104	1-216-814-11	RES-CHIP	270	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E))			
R105	1-216-807-11	RES-CHIP	68	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E))			
R106	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R107	1-216-828-11	RES-CHIP	3.9K	5%	1/16W
R108	1-218-839-11	METAL CHIP	470	0.5%	1/10W
R109	1-216-019-00	RES-CHIP	56	5%	1/10W
R111	1-216-833-11	RES-CHIP	10K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R112	1-218-867-11	RES-CHIP	6.8K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R113	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R114	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R115	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R117	1-216-837-11	RES-CHIP	22K	5%	1/16W
R118	1-216-817-11	RES-CHIP	470	5%	1/16W
R119	1-216-837-11	RES-CHIP	22K	5%	1/16W
R120	1-216-824-11	RES-CHIP	1.8K	5%	1/16W
R121	1-216-837-11	RES-CHIP	22K	5%	1/16W
R122	1-216-851-11	RES-CHIP	330K	5%	1/16W
R123	1-216-837-11	RES-CHIP	22K	5%	1/16W
R124	1-216-837-11	RES-CHIP	22K	5%	1/16W
R125	1-215-925-11	METAL OXIDE	22K	5%	3W
R128	1-216-809-11	RES-CHIP	100	5%	1/16W
R129	1-211-977-11	METAL CHIP	22	0.5%	1/10W
R130	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R133	1-249-389-11	CARBON	4.7	5%	1/4W
R134	1-216-864-11	SHORT	0		
R135	1-216-864-11	SHORT	0		
R200	1-216-827-11	RES-CHIP	3.3K	5%	1/16W
R201	1-216-821-11	RES-CHIP	1K	5%	1/16W
		(KV-HA21M60/HA21P52)			
R201	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
		(EXCEPT KV-HA21M60/HA21P52)			
R202	1-216-841-11	RES-CHIP	47K	5%	1/16W
R203	1-216-864-11	SHORT	0 (KV-HA21M60/HA21P52)		
R203	1-216-041-00	RES-CHIP	470	5%	1/10W
		(EXCEPT KV-HA21M60/HA21P52)			
R204	1-216-827-11	RES-CHIP	3.3K	5%	1/16W
R206	1-216-834-11	RES-CHIP	12K	5%	1/16W
R207	1-216-834-11	RES-CHIP	12K	5%	1/16W
R208	1-216-833-11	RES-CHIP	10K	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E)/ HA21P52)			
R209	1-216-833-11	RES-CHIP	10K	5%	1/16W
		(KV-HA21M50/HA21M60/HA21M80(E)/ HA21P52)			
R210	1-249-409-11	CARBON	220	5%	1/4W
R211	1-249-409-11	CARBON	220	5%	1/4W
R212	1-216-821-11	RES-CHIP	1K	5%	1/16W
R214	1-216-864-11	SHORT	0		

REF NO.	PART NO.	DESCRIPTION			REMARK
R215	1-216-827-11	RES-CHIP	3.3K	5%	1/16W
R216	1-216-827-11	RES-CHIP	3.3K	5%	1/16W
R217	1-216-826-11	RES-CHIP	2.7K	5%	1/16W
R218	1-216-826-11	RES-CHIP	2.7K	5%	1/16W
R219	1-216-809-11	RES-CHIP	100	5%	1/16W
R220	1-216-809-11	RES-CHIP	100	5%	1/16W
R221	1-216-025-11	RES-CHIP	100	5%	1/10W
		(EXCEPT KV-HA21M60)			
R222	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R225	1-216-835-11	RES-CHIP	15K	5%	1/16W
R228	1-216-864-11	SHORT	0		
R229	1-216-823-11	RES-CHIP	1.5K	5%	1/16W
R230	1-216-823-11	RES-CHIP	1.5K	5%	1/16W
R231	1-216-821-11	RES-CHIP	1K	5%	1/16W
R234	1-216-853-11	RES-CHIP	470K	5%	1/16W
R235	1-216-853-11	RES-CHIP	470K	5%	1/16W
R240	1-216-835-11	RES-CHIP	15K	5%	1/16W
R241	1-216-835-11	RES-CHIP	15K	5%	1/16W
R242	1-216-833-11	RES-CHIP	10K	5%	1/16W
R243	1-216-833-11	RES-CHIP	10K	5%	1/16W
R244	1-216-853-11	RES-CHIP	470K	5%	1/16W
R248	1-216-843-11	RES-CHIP	68K	5%	1/16W
R249	1-216-821-11	RES-CHIP	1K	5%	1/16W
R300	1-216-813-11	RES-CHIP	220	5%	1/16W
R301	1-216-813-11	RES-CHIP	220	5%	1/16W
		(EXCEPT KV-HA21P52)			
R302	1-216-813-11	RES-CHIP	220	5%	1/16W
R303	1-216-813-11	RES-CHIP	220	5%	1/16W
		(EXCEPT KV-HA21P52)			
R304	1-216-821-11	RES-CHIP	1K	5%	1/16W
		(KV-HA21M60)			
R304	1-216-051-00	RES-CHIP	1.2K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R305	1-216-819-11	RES-CHIP	680	5%	1/16W
		(EXCEPT KV-HA21P52)			
R306	1-216-816-11	RES-CHIP	390	5%	1/16W
R307	1-216-813-11	RES-CHIP	220	5%	1/16W
R308	1-216-027-00	RES-CHIP	120	5%	1/10W
		(EXCEPT KV-HA21M60/HA21P52)			
R309	1-216-029-00	RES-CHIP	150	5%	1/10W
		(EXCEPT HA21M60/HA21P52)			
R309	1-216-813-11	RES-CHIP	220	5%	1/16W
		(KV-HA21M60)			
R310	1-216-816-11	RES-CHIP	390	5%	1/16W
R311	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R312	1-216-813-11	RES-CHIP	220	5%	1/16W
R313	1-216-815-11	RES-CHIP	330	5%	1/16W
R314	1-218-835-11	METAL CHIP	330	0.5%	1/10W
R315	1-216-837-11	RES-CHIP	22K	5%	1/16W
R316	1-216-812-11	RES-CHIP	180	5%	1/16W
R317	1-216-817-11	RES-CHIP	470	5%	1/16W
R318	1-216-837-11	RES-CHIP	22K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R319	1-216-817-11	RES-CHIP	470	5%	1/16W
		(EXCEPT KV-HA21P52)			
R320	1-216-837-11	RES-CHIP	22K	5%	1/16W
R323	1-216-817-11	RES-CHIP	470	5%	1/16W
R324	1-216-817-11	RES-CHIP	470	5%	1/16W
		(EXCEPT KV-HA21P52)			
R325	1-216-837-11	RES-CHIP	22K	5%	1/16W
		(EXCEPT KV-HA21P52)			
R326	1-216-837-11	RES-CHIP	22K	5%	1/16W
		(EXCEPT KV-HA21P52)			

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REF NO.	PART NO.	DESCRIPTION		REMARK	
R327	1-216-821-11	RES-CHIP	1K	5%	1/16W
R328	1-216-809-11	RES-CHIP	100	5%	1/16W
R329	1-216-818-11	RES-CHIP	560	5%	1/16W
		(EXCEPT KV-HA21M81)			
R329	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M81)			
R330	1-216-864-11	SHORT	0 (EXCEPT KV-HA21M81)		
R330	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M81)			
R331	1-216-864-11	SHORT	0 (EXCEPT KV-HA21M81)		
R331	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M81)			
R332	1-216-864-11	SHORT	0 (EXCEPT KV-HA21M81)		
R332	1-216-041-00	RES-CHIP	470	5%	1/10W
		(KV-HA21M81)			
R333	1-216-827-11	RES-CHIP	3.3K	5%	1/16W
R334	1-216-809-11	RES-CHIP	100	5%	1/16W
R335	1-216-809-11	RES-CHIP	100	5%	1/16W
R336	1-216-809-11	RES-CHIP	100	5%	1/16W
R337	1-216-833-11	RES-CHIP	10K	5%	1/16W
R339	1-216-814-11	RES-CHIP	270	5%	1/16W
R340	1-162-974-11	CERAMIC CHIP	0.01UF		50V
R342	1-216-864-11	SHORT	0		
R345	1-216-809-11	RES-CHIP	100	5%	1/16W
R348	1-216-809-11	RES-CHIP	100	5%	1/16W
R350	1-216-816-11	RES-CHIP	390	5%	1/16W
R353	1-216-119-00	RES-CHIP	820K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R354	1-216-119-00	RES-CHIP	820K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R355	1-216-061-91	RES-CHIP	3.3K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R356	1-216-061-91	RES-CHIP	3.3K	5%	1/10W
		(EXCEPT KV-HA21M60)			
R357	1-216-847-11	RES-CHIP	150K	5%	1/16W
R358	1-216-809-11	RES-CHIP	100	5%	1/16W
R360	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R361	1-216-813-11	RES-CHIP	220	5%	1/16W
R362	1-216-838-11	RES-CHIP	27K	5%	1/16W
R363	1-216-864-11	SHORT	0		
R364	1-216-835-11	RES-CHIP	15K	5%	1/16W
R365	1-216-864-11	SHORT	0		
R367	1-216-846-11	RES-CHIP	120K	5%	1/16W
R368	1-216-821-11	RES-CHIP	1K	5%	1/16W
R369	1-216-858-11	RES-CHIP	1.2M	5%	1/16W
R370	1-216-838-11	RES-CHIP	27K	5%	1/16W
R371	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R374	1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R376	1-216-864-11	SHORT	0		
R377	1-216-025-11	RES-CHIP	100	5%	1/10W
		(KV-HA21M81)			
R378	1-216-049-11	RES-CHIP	1K	5%	1/10W
		(KV-HA21M81)			
R379	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
		(KV-HA21M81)			
R384	1-216-809-11	RES-CHIP	100	5%	1/16W
		(KV-HA21M60)			
R385	1-216-809-11	RES-CHIP	100	5%	1/16W
		(KV-HA21M60)			
R386	1-216-809-11	RES-CHIP	100	5%	1/16W
		(KV-HA21M60)			
R387	1-216-809-11	RES-CHIP	100	5%	1/16W
		(KV-HA21M60)			
R388	1-216-809-11	RES-CHIP	100	5%	1/16W
		(KV-HA21M60)			

REF NO.	PART NO.	DESCRIPTION		REMARK	
R389	1-216-851-11	RES-CHIP	330K	5%	1/16W
		(EXCEPT KV-HA21M80(VIETNAM))			
R392	1-218-867-11	RES-CHIP	6.8K	5%	1/16W
R393	1-216-295-91	SHORT	0 (EXCEPT KV-HA21M60)		
R400	1-216-864-11	SHORT	0		
R401	1-216-821-11	RES-CHIP	1K	5%	1/16W
R402	1-216-809-11	RES-CHIP	100	5%	1/16W
R403	1-216-833-11	RES-CHIP	10K	5%	1/16W
R404	1-216-821-11	RES-CHIP	1K	5%	1/16W
R405	1-216-833-11	RES-CHIP	10K	5%	1/16W
R406	1-216-853-11	RES-CHIP	470K	5%	1/16W
R407	1-216-821-11	RES-CHIP	1K	5%	1/16W
R408	1-216-821-11	RES-CHIP	1K	5%	1/16W
R409	1-216-853-11	RES-CHIP	470K	5%	1/16W
R410	1-216-809-11	RES-CHIP	100	5%	1/16W
R411	1-216-821-11	RES-CHIP	1K	5%	1/16W
R412	1-216-821-11	RES-CHIP	1K	5%	1/16W
R413	1-216-853-11	RES-CHIP	470K	5%	1/16W
R414	1-216-821-11	RES-CHIP	1K	5%	1/16W
R415	1-216-833-11	RES-CHIP	10K	5%	1/16W
R416	1-216-833-11	RES-CHIP	10K	5%	1/16W
R417	1-216-807-11	RES-CHIP	68	5%	1/16W
R418	1-216-809-11	RES-CHIP	100	5%	1/16W
R419	1-216-840-11	RES-CHIP	39K	5%	1/16W
R420	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R421	1-218-847-11	METAL CHIP	1K	0.5%	1/10W
R422	1-216-842-11	RES-CHIP	56K	5%	1/16W
R423	1-216-840-11	RES-CHIP	39K	5%	1/16W
R424	1-216-842-11	RES-CHIP	56K	5%	1/16W
R425	1-216-022-00	RES-CHIP	75	5%	1/10W
R426	1-216-821-11	RES-CHIP	1K	5%	1/16W
R427	1-216-822-11	RES-CHIP	1.2K	5%	1/16W
R428	1-216-817-11	RES-CHIP	470	5%	1/16W
R429	1-216-833-11	RES-CHIP	10K	5%	1/16W
R430	1-216-828-11	RES-CHIP	3.9K	5%	1/16W
R431	1-216-842-11	RES-CHIP	56K	5%	1/16W
R432	1-216-857-11	RES-CHIP	1M	5%	1/16W
R433	1-216-842-11	RES-CHIP	56K	5%	1/16W
R434	1-216-821-11	RES-CHIP	1K	5%	1/16W
R435	1-216-857-11	RES-CHIP	1M	5%	1/16W
R436	1-216-022-00	RES-CHIP	75	5%	1/10W
R438	1-216-821-11	RES-CHIP	1K	5%	1/16W
R440	1-216-857-11	RES-CHIP	1M	5%	1/16W
R443	1-216-857-11	RES-CHIP	1M	5%	1/16W
R445	1-216-841-11	RES-CHIP	47K	5%	1/16W
R446	1-216-841-11	RES-CHIP	47K	5%	1/16W
R500	1-260-126-81	CARBON	180K	5%	1/2W
R501	1-249-419-11	CARBON	1.5K	5%	1/4W
R502	1-216-370-11	METAL OXIDE	1.2	5%	2W
R503	1-216-842-11	RES-CHIP	56K	5%	1/16W
R504	1-216-842-11	RES-CHIP	56K	5%	1/16W
R505	1-216-829-11	RES-CHIP	4.7K	5%	1/16W
R506	1-260-125-11	CARBON	150K	5%	1/2W
R507	1-260-288-11	CARBON	0.47	5%	1/2W
R508	1-260-288-11	CARBON	0.47	5%	1/2W
R509	1-260-288-11	CARBON	0.47	5%	1/2W
R510	1-260-127-11	CARBON	220K	5%	1/2W
R511	1-215-449-00	METAL	15K	1%	1/4W
R512	1-215-453-00	METAL	22K	1%	1/4W
R513	1-215-445-00	METAL	10K	1%	1/4W
R514	1-249-421-11	CARBON	2.2K	5%	1/4W

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF NO.		PART NO.	DESCRIPTION			REMARK
R520		1-216-833-11	RES-CHIP	10K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R521		1-216-833-11	RES-CHIP	10K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R522		1-216-833-11	RES-CHIP	10K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R523		1-216-837-11	RES-CHIP	22K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R524		1-216-837-11	RES-CHIP	22K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R525		1-216-864-11	SHORT	0		
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R526		1-216-837-11	RES-CHIP	22K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R527		1-216-837-11	RES-CHIP	22K	5%	1/16W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R528		1-215-857-71	METAL OXIDE	10	5%	1W
			(KV-HA21M50/HA21M60/HA21M80(E)/ HA21M81)			
R553		1-249-385-11	CARBON	2.2	5%	1/4W
R554		1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R557		1-218-851-11	METAL CHIP	1.5K	0.5%	1/10W
R558		1-216-837-11	RES-CHIP	22K	5%	1/16W
R559		1-218-887-11	METAL CHIP	47K	0.5%	1/10W
R563		1-218-851-11	METAL CHIP	1.5K	0.5%	1/10W
R564		1-215-865-11	METAL OXIDE	220	5%	1W
R565		1-216-350-11	METAL OXIDE	1.2	5%	1W
R567		1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R568		1-215-461-00	METAL	47K	1%	1/4W
R600		1-215-915-11	METAL OXIDE	470	5%	3W
R601		1-215-883-11	METAL OXIDE	33	5%	2W
			(KV-HA21M81)			
R602		1-205-998-11	CEMENTED	1	5%	10W
			(KV-HA21M60/HA21P52)			
R602		1-240-262-11	CEMENTED	0.68	5%	10W
			(EXCEPT KV-HA21M60/HA21P52)			
R603		1-205-998-11	CEMENTED	1	5%	10W
			(KV-HA21M60/HA21P52)			
R603		1-240-262-11	CEMENTED	0.68	5%	10W
			(EXCEPT KV-HA21M60/HA21P52)			
R605		1-217-191-21	METAL	0.18	10%	2W
R606		1-216-819-11	RES-CHIP	680	5%	1/16W
R608		1-260-127-11	CARBON	220K	5%	1/2W
R609		1-216-842-11	RES-CHIP	56K	5%	1/16W
R610		1-215-926-00	METAL OXIDE	33K	5%	3W
R611		1-216-830-11	RES-CHIP	5.6K	5%	1/16W
R612		1-249-420-11	CARBON	1.8K	5%	1/4W
R615		1-215-877-11	METAL OXIDE	22K	5%	1W
R617		1-216-821-11	RES-CHIP	1K	5%	1/16W
R619	⚠	1-218-265-11	METAL	8.2M	5%	1W
R620		1-249-389-11	CARBON	4.7	5%	1/4W
R623		1-216-823-11	RES-CHIP	1.5K	5%	1/16W
R624		1-260-126-81	CARBON	180K	5%	1/2W
R627		1-205-998-11	CEMENTED	1	5%	10W
			(KV-HA21M60/HA21P52)			
R627		1-240-262-11	CEMENTED	0.68	5%	10W
			(EXCEPT KV-HA21M60/HA21P52)			

REF NO.		PART NO.	DESCRIPTION			REMARK
R800		1-216-821-11	RES-CHIP	1K	5%	1/16W
R801		1-216-837-11	RES-CHIP	22K	5%	1/16W
R802		1-215-917-11	METAL OXIDE	1K	5%	3W
R803		1-260-332-51	CARBON	2.2K	5%	1/2W
R806		1-216-864-11	SHORT	0		
R808		1-249-421-11	CARBON	2.2K	5%	1/4W
R810		1-215-886-11	METAL OXIDE	100	5%	2W
R811		1-215-911-11	METAL OXIDE	100	5%	3W
R812		1-215-917-11	METAL OXIDE	1K	5%	3W
R813		1-216-821-11	RES-CHIP	1K	5%	1/16W
R814		1-215-917-11	METAL OXIDE	1K	5%	3W
R860		1-218-901-11	METAL CHIP	180K	0.5%	1/10W
R861		1-216-864-11	SHORT	0		
R862		1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R863		1-216-833-11	RES-CHIP	10K	5%	1/16W
R864		1-218-859-11	METAL CHIP	3.3K	0.5%	1/10W
R865		1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R866		1-216-821-11	RES-CHIP	1K	5%	1/16W
R867		1-218-877-11	METAL CHIP	18K	0.5%	1/10W
R868		1-249-393-11	CARBON	10	5%	1/4W
R869		1-249-381-11	CARBON	1	5%	1/4W
R870		1-218-903-11	METAL CHIP	220K	0.5%	1/10W
R874		1-215-475-00	METAL	180K	1%	1/4W
R878		1-216-821-11	RES-CHIP	1K	5%	1/16W
R879		1-216-825-11	RES-CHIP	2.2K	5%	1/16W
R880		1-218-895-11	METAL CHIP	100K	0.5%	1/10W
R881		1-218-883-11	METAL CHIP	33K	0.5%	1/10W
R882		1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R883		1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R884		1-216-841-11	RES-CHIP	47K	5%	1/16W
R885		1-216-833-11	RES-CHIP	10K	5%	1/16W
R886		1-216-864-11	SHORT	0		
R887		1-215-477-00	METAL	220K	1%	1/4W
R888		1-215-477-00	METAL	220K	1%	1/4W
R889		1-218-895-11	METAL CHIP	100K	0.5%	1/10W
			<VARIABLE RESISTOR>			
RV300		1-241-769-11	RES, ADJ, CARBON 470K			
			<SWITCH>			
S001		1-692-431-21	SWITCH, TACTILE			
S002		1-692-431-21	SWITCH, TACTILE			
S003		1-692-431-21	SWITCH, TACTILE			
S004		1-692-431-21	SWITCH, TACTILE			
S005		1-692-431-21	SWITCH, TACTILE			
S006		1-692-431-21	SWITCH, TACTILE			
S600	⚠	1-571-433-21	SWITCH, PUSH (AC POWER)			
S800		1-572-707-11	SWITCH, LEVER			
			<#########>			
SWF100		1-781-149-11	FILTER, SARFACE WAVE (K725)			
			<TRANSFORMER>			
T503	⚠	1-453-329-21	TRANSFORMER ASSY FLYBACK			
			(NX-4751//M3A4)			
T600	⚠	1-424-682-11	COIL, LINE FILTER			
			(KV-HA21M60/HA21P52/ HA21M80(VIETNAM))			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

A **A3**

REF NO.		PART NO.	DESCRIPTION	REMARK
T600	⚠	1-431-747-11	TRANSFORMER, LINE FILTER (KV-HA21M50/HA21M80(E)/HA21M80/H/ HA21M81)	
T601	⚠	1-437-333-11	TRANSFORMER, CONVERTER (SRT)	
T800		1-435-374-11	TRANSFORMER, FERRITE (HDT)	
			<THERMISTOR>	
THP600		1-803-744-11	THERMISTOR, POSITIVE	
			<TUNER>	
TU100		8-598-591-00	TUNER, VSS BT-AG402	
			<VARISTOR>	
VDR600		1-803-830-11	VARISTOR (ERZV14D621)	
			<CRYSTAL>	
X001		1-577-358-21	VIBRATOR, CERAMIC	
X300		1-567-505-11	OSCILLATOR, CRYSTAL	
X301		1-567-504-11	OSCILLATOR, CRYSTAL	

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* A-1400-242-A A3 BOARD MOUNTED (KV-HA21M60)
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<CAPACITOR>

C2101	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2102	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C2103	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C2104	1-163-247-91	CERAMIC CHIP	68PF	5.00%	50V
C2105	1-163-251-11	CERAMIC CHIP	100PF	5.00%	50V
C2201	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C2202	1-163-243-11	CERAMIC CHIP	47PF	5.00%	50V
C2203	1-126-947-11	ELECT	47UF	20.00%	25V
C2204	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2205	1-164-005-11	CERAMIC CHIP	0.47UF		25V
C2208	1-163-009-91	CERAMIC CHIP	0.001UF	10.00%	50V
C2209	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2210	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2211	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2213	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2214	1-164-222-91	CERAMIC CHIP	0.22UF		25V
C2301	1-163-247-91	CERAMIC CHIP	68PF	5.00%	50V
C2302	1-163-009-91	CERAMIC CHIP	0.001UF	10.00%	50V
C2303	1-164-182-11	CERAMIC CHIP	0.0033UF	10.00%	50V
C2304	1-163-009-91	CERAMIC CHIP	0.001UF	10.00%	50V
C2305	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2306	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2307	1-163-009-91	CERAMIC CHIP	0.001UF	10.00%	50V
C2308	1-163-009-91	CERAMIC CHIP	0.001UF	10.00%	50V
C2309	1-163-031-91	CERAMIC CHIP	0.01UF		50V
C2401	1-164-346-11	CERAMIC CHIP	1UF		16V
C2402	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2403	1-126-947-11	ELECT	47UF	20.00%	25V
C2404	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2405	1-163-087-00	CERAMIC CHIP	4PF	0.25PF	50V
C2406	1-163-087-00	CERAMIC CHIP	4PF	0.25PF	50V
C2407	1-163-017-00	CERAMIC CHIP	0.0047UF	10.00%	50V
C2408	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2409	1-117-720-11	CERAMIC CHIP	4.7UF		10V
C2410	1-126-965-91	ELECT	22UF	20.00%	50V
C2411	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2413	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2414	1-126-961-11	ELECT	2.2UF	20.00%	50V
C2415	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2416	1-164-161-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C2417	1-164-161-11	CERAMIC CHIP	0.0022UF	10.00%	50V
C2418	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2419	1-117-720-11	CERAMIC CHIP	4.7UF		10V
C2501	1-164-505-11	CERAMIC CHIP	2.2UF		16V
C2502	1-164-505-11	CERAMIC CHIP	2.2UF		16V
C2601	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2602	1-163-038-91	CERAMIC CHIP	0.1UF		25V
C2603	1-126-947-11	ELECT	47UF	20.00%	25V
C2604	1-126-947-11	ELECT	47UF	20.00%	25V

<FILTER>

CF2201	1-234-685-21	FILTER, BAND PASS (F4.5D)	

<CONNECTOR>

CN2101	*	1-774-812-11	CONNECTOR, BOARD TO BOARD 7P
CN2102	*	1-774-812-11	CONNECTOR, BOARD TO BOARD 7P

<TRIMMER>

CT2101	1-767-774-22	TRAP, CERAMIC	

<DIODE>

D2301	8-719-988-61	1SS355TE-17	
D2302	8-719-988-61	1SS355TE-17	
D2401	8-719-988-61	1SS355TE-17	

<FERRITE BEAD>

FB2401	1-414-233-22	FERRITE	0UH
FB2402	1-414-233-22	FERRITE	0UH
FB2403	1-414-233-22	FERRITE	0UH
FB2404	1-414-233-22	FERRITE	0UH
FB2405	1-414-231-22	FERRITE	0UH
FB2406	1-414-231-22	FERRITE	0UH
FB2407	1-414-233-22	FERRITE	0UH
FB2501	1-414-233-22	FERRITE	0UH

<IC>

IC2201	6-700-979-01	IC LA7567BM-TRM
IC2401	6-700-124-01	IC MSP3417G-QG-B8
IC2601	8-759-052-52	L78M05T-FA

<COIL>

L2101	1-414-141-11	INDUCTOR	0.82UH
L2103	1-410-987-42	INDUCTOR	0.33UH

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

A3 CV

REF NO.	PART NO.	DESCRIPTION			REMARK
L2201	1-410-509-61	INDUCTOR	10UH		
L2302	1-414-855-31	INDUCTOR	1UH		
L2303	1-414-855-31	INDUCTOR	1UH		
		<TRANSISTOR>			
Q2101	8-729-047-14	TRANSISTOR 2SC3775			
Q2301	8-729-120-28	2SC1623-L5L6			
Q2302	8-729-039-57	DTC363EKT146			
Q2303	8-729-039-57	DTC363EKT146			
Q2304	8-729-424-67	UN2216			
		<RESISTOR>			
R2101	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R2102	1-216-013-00	RES-CHIP	33	5%	1/10W
R2103	1-216-013-00	RES-CHIP	33	5%	1/10W
R2104	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R2105	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R2106	1-216-049-11	RES-CHIP	1K	5%	1/10W
R2108	1-216-035-00	RES-CHIP	270	5%	1/10W
R2201	1-216-043-91	RES-CHIP	560	5%	1/10W
R2202	1-216-037-00	RES-CHIP	330	5%	1/10W
R2203	1-216-025-11	RES-CHIP	100	5%	1/10W
R2204	1-216-029-00	RES-CHIP	150	5%	1/10W
R2205	1-216-037-00	RES-CHIP	330	5%	1/10W
R2206	1-216-073-91	RES-CHIP	10K	5%	1/10W
R2207	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R2209	1-216-097-11	RES-CHIP	100K	5%	1/10W
R2211	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R2212	1-216-097-11	RES-CHIP	100K	5%	1/10W
R2213	1-216-295-91	SHORT	0		
R2214	1-208-852-11	METAL CHIP	820K	0.5%	1/10W
R2301	1-216-037-00	RES-CHIP	330	5%	1/10W
R2302	1-216-063-91	RES-CHIP	3.9K	5%	1/10W
R2303	1-216-075-00	RES-CHIP	12K	5%	1/10W
R2304	1-216-025-11	RES-CHIP	100	5%	1/10W
R2305	1-216-041-00	RES-CHIP	470	5%	1/10W
R2306	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R2307	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R2308	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R2309	1-216-073-91	RES-CHIP	10K	5%	1/10W
R2401	1-216-049-11	RES-CHIP	1K	5%	1/10W
R2403	1-216-049-11	RES-CHIP	1K	5%	1/10W
R2501	1-216-025-11	RES-CHIP	100	5%	1/10W
R2502	1-216-025-11	RES-CHIP	100	5%	1/10W
R2503	1-216-025-11	RES-CHIP	100	5%	1/10W
R2504	1-216-025-11	RES-CHIP	100	5%	1/10W
R2601	1-215-858-00	METAL OXIDE	15	5%	1W
		<FILTER>			
SF2101	1-795-295-11	FILTER, SAW (38MHZ)			
SF2102	1-767-302-11	FILTER, SURFACE WAVE			
		<TRANSFORMER>			
T2201	1-416-803-11	COIL, VARIABLE			

REF NO.		PART NO.	DESCRIPTION			
			<CRYSTAL>			
X2401		1-781-041-11	VIBRATOR, CRYSTAL			
**********						
	*	A-1332-200-A	CV BOARD MOUNTED (KV-HA21M50/HA21M80(E)/HA21M80/H/ HA21M81)			
	*	A-1332-259-A	CV BOARD MOUNTED (KV-HA21M80 (VIETNAM))			
	*	A-1332-245-A	CV BOARD MOUNTED (KV-HA21M60/HA21P52) **********			
		4-382-854-01	SCREW (M3X8), P, SW (+)			
			<CAPACITOR>			
C701		1-115-350-51	CERAMIC	0.0047UF		2KV
C702		1-102-074-00	CERAMIC	0.001UF	10.00%	50V
C703		1-107-651-11	ELECT	4.7UF	20.00%	250V
C704		1-130-202-00	FILM	0.022UF	5.00%	400V
C706		1-126-947-11	ELECT	47UF	20.00%	16V
C708		1-102-114-00	CERAMIC	470PF	10.00%	50V
C709		1-102-114-00	CERAMIC	470PF	10.00%	50V
C710		1-102-114-00	CERAMIC	470PF	10.00%	50V
C712		1-102-114-00	CERAMIC	470PF	10.00%	50V
C713		1-102-115-00	CERAMIC	560PF	10.00%	50V
C714		1-102-115-00	CERAMIC	560PF	10.00%	50V
C716		1-126-933-11	ELECT	100UF	20.00%	16V
C717		1-102-852-91	CERAMIC	47PF	5.00%	50V
C718		1-126-933-11	ELECT	100UF	20.00%	16V
C719		1-102-116-00	CERAMIC	680PF	10.00%	50V
			<CONNECTOR>			
CN701	*	1-564-508-11	PLUG, CONNECTOR 5P			
CN702		1-695-915-11	TAB (CONTACT)			
CN703	*	1-564-509-11	PLUG, CONNECTOR 6P			
CN704		1-695-915-11	TAB (CONTACT)			
			<DIODE>			
D701		8-719-911-19	1SS119-25			
D702		8-719-911-19	1SS119-25			
D703		8-719-911-19	1SS119-25			
D707		8-719-911-19	1SS119-25			
D708		8-719-911-19	1SS119-25			
D709		8-719-911-19	1SS119-25			
D713		8-719-911-19	1SS119-25			
D714		8-719-911-19	1SS119-25			
D715		8-719-911-19	1SS119-25			
D716		8-719-911-19	1SS119-25			
D717		8-719-070-16	NNCD9.1A-T1			
			<JACK>			
J701	⚠	1-540-071-22	SOCKET, CRT			

CV V2

REF NO.	PART NO.	DESCRIPTION			REMARK
		<COIL>			
L701	1-414-185-41	INDUCTOR	22UH		
L710	1-414-183-41	INDUCTOR	10UH		
		(EXCEPT KV-HA21M80(VIETNAM))			
L710	1-414-186-31	INDUCTOR	33UH		
		(KV-HA21M80(VIETNAM))			
L711	1-414-185-41	INDUCTOR	22UH		
		(KV-HA21M80(VIETNAM))			
L712	1-414-185-41	INDUCTOR	22UH		
		(KV-HA21M80(VIETNAM))			
		<TRANSISTOR>			
Q704	8-729-326-11	2SC2611			
Q705	8-729-326-11	2SC2611			
Q706	8-729-326-11	2SC2611			
Q707	8-729-200-17	2SA1091-O			
Q708	8-729-200-17	2SA1091-O			
Q709	8-729-200-17	2SA1091-O			
Q710	8-729-119-78	2SC2785-HFE			
Q711	8-729-119-78	2SC2785-HFE			
Q712	8-729-119-78	2SC2785-HFE			
		<RESISTOR>			
R703	1-219-752-11	CARBON	100K	5%	1/2W
R706	1-215-417-00	METAL	680	1%	1/4W
R707	1-215-413-00	METAL	470	1%	1/4W
R708	1-216-387-11	METAL OXIDE	0.68	5%	3W
R710	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R711	1-260-330-11	CARBON	1.5K	5%	1/2W
R712	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R713	1-260-330-11	CARBON	1.5K	5%	1/2W
R714	1-216-486-00	METAL OXIDE	8.2K	5%	3W
R715	1-260-330-11	CARBON	1.5K	5%	1/2W
R716	1-249-923-11	CARBON	1K	5%	1/4W
R717	1-249-923-11	CARBON	1K	5%	1/4W
R718	1-249-923-11	CARBON	1K	5%	1/4W
R725	1-249-421-11	CARBON	2.2K	5%	1/4W
R726	1-249-421-11	CARBON	2.2K	5%	1/4W
R727	1-249-421-11	CARBON	2.2K	5%	1/4W
R728	1-249-408-11	CARBON	180	5%	1/4W
R729	1-249-408-11	CARBON	180	5%	1/4W
R730	1-249-408-11	CARBON	180	5%	1/4W
R731	1-249-407-11	CARBON	150	5%	1/4W
R732	1-249-407-11	CARBON	150	5%	1/4W
R733	1-249-407-11	CARBON	150	5%	1/4W
R734	1-219-743-11	CARBON	100	5%	1/2W
R738	1-247-807-31	CARBON	100	5%	1/4W
R739	1-247-807-31	CARBON	100	5%	1/4W
R740	1-247-807-31	CARBON	100	5%	1/4W
R755	1-249-418-11	CARBON	1.2K	5%	1/4W
R756	1-249-418-11	CARBON	1.2K	5%	1/4W
R757	1-249-418-11	CARBON	1.2K	5%	1/4W
		<VARIABLE RESISTOR>			
RV702	1-241-656-11	RES, ADJ, METAL FILM 110M			

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REF NO.		PART NO.	DESCRIPTION			REMARK
	*	A-1342-630-A	V2 BOARD MOUNTED (KV-HA21M81)			
			**********			
			<CAPACITOR>			
C5802		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5805		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5806		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5815		1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C5816		1-126-963-11	ELECT	4.7UF	20.00%	50V
C5817		1-107-826-11	CERAMIC CHIP	0.1UF	10.00%	16V
C5818		1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
C5820		1-162-924-11	CERAMIC CHIP	56PF	5.00%	50V
C5821		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5822		1-162-964-11	CERAMIC CHIP	0.001UF	10.00%	50V
C5823		1-126-963-11	ELECT	4.7UF	20.00%	50V
C5826		1-126-963-11	ELECT	4.7UF	20.00%	50V
C5830		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5831		1-126-933-11	ELECT	100UF	20.00%	16V
C5835		1-163-038-91	CERAMIC CHIP	0.1UF		25V
C5837		1-126-933-11	ELECT	100UF	20.00%	16V
C5852		1-162-995-11	CERAMIC CHIP	0.022UF		50V
C5853		1-126-963-11	ELECT	4.7UF	20.00%	50V
			<CONNECTOR>			
CN5801	*	1-774-812-11	CONNECTOR, BOARD TO BOARD 7P			
CN5803	*	1-774-812-11	CONNECTOR, BOARD TO BOARD 7P			
			<DIODE>			
D5802		8-719-914-44	DAP202K			
D5803		8-719-045-99	RD2.2M-T1B			
			<FERRITE BEAD>			
FB5801		1-410-397-21	FERRITE	1.1UH		
FB5803		1-410-397-21	FERRITE	1.1UH		
FB5804		1-410-397-21	FERRITE	1.1UH		
FB5805		1-410-397-21	FERRITE	1.1UH		
			<IC>			
IC5801		6-700-607-01	IC SAA5264PS/M3			
IC5802		8-759-828-44	NJM2870F33-TE2			
			<CHIP CONDUCTOR>			
JR5802		1-216-295-91	SHORT	0		
JR5803		1-216-295-91	SHORT	0		
JR5804		1-216-295-91	SHORT	0		
JR5805		1-216-295-91	SHORT	0		
JR5811		1-216-041-00	RES-CHIP	470	5%	1/10W
JR5812		1-216-041-00	RES-CHIP	470	5%	1/10W
JR5813		1-216-041-00	RES-CHIP	470	5%	1/10W
			<TRANSISTOR>			
Q5801		8-729-230-49	2SC2712-YG			
Q5803		8-729-230-49	2SC2712-YG			
Q5810		8-729-230-49	2SC2712-YG			

V2

REF NO.	PART NO.	DESCRIPTION			REMARK
		<RESISTOR>			
R5821	1-216-082-00	RES-CHIP	24K	5%	1/10W
R5822	1-216-025-11	RES-CHIP	100	5%	1/10W
R5828	1-216-025-11	RES-CHIP	100	5%	1/10W
R5829	1-216-025-11	RES-CHIP	100	5%	1/10W
R5830	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R5831	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R5839	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R5841	1-216-025-11	RES-CHIP	100	5%	1/10W
R5842	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R5843	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R5845	1-216-049-11	RES-CHIP	1K	5%	1/10W
R5846	1-216-049-11	RES-CHIP	1K	5%	1/10W
R5851	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R5853	1-216-830-11	RES-CHIP	5.6K	5%	1/16W
R5857	1-216-081-00	RES-CHIP	22K	5%	1/10W
R5859	1-216-029-00	RES-CHIP	150	5%	1/10W
R5860	1-216-029-00	RES-CHIP	150	5%	1/10W
R5862	1-216-029-00	RES-CHIP	150	5%	1/10W
R5864	1-216-041-00	RES-CHIP	470	5%	1/10W
R5866	1-216-449-11	METAL OXIDE	56	5%	2W
R5871	1-216-037-00	RES-CHIP	330	5%	1/10W
R5878	1-216-073-91	RES-CHIP	10K	5%	1/10W
R5884	1-216-025-11	RES-CHIP	100	5%	1/10W
R5892	1-216-025-11	RES-CHIP	100	5%	1/10W
R5899	1-216-025-11	RES-CHIP	100	5%	1/10W
		<CRYSTAL>			
X5801	1-578-774-11	VIBRATOR, CRYSTAL			

****

ACCESSORIES AND PACKING MATERIALS
****

	1-501-372-81	ANTENNA, TELESCOPIC (KV-HA21M80(E)/HA21M80/H)
	1-417-151-22	MATCHING TRANSFORMER, ANTENNA (KV-HA21M80(E)/HA21M80/H)
	1-569-008-21	ADAPTOR, CONVERSION 2P (KV-HA21M80/H/HA21M81)
	3-701-910-00	SCREW, SPECIAL (DIA. 3.8X20)
	4-085-922-11	MANUAL, INSTRUCTION (KV-HA21M50)
	4-086-232-12	MANUAL, INSTRUCTION (KV-HA21M60)
	4-086-150-11	MANUAL, INSTRUCTION (KV-HA21M80(E))
	4-086-889-11	MANUAL, INSTRUCTION (KV-HA21M80 (VIETNAM))
	4-085-449-11	MANUAL, INSTRUCTION (KV-HA21M80/H/HA21M81)
	4-086-232-12	MANUAL, INSTRUCTION (KV-HA21P52)
*	4-086-424-01	CUSHION, LOWER (KV-HA21M60/HA21P52)
*	4-085-463-01	CUSHION, LOWER (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
*	4-086-891-01	CUSHION, LOWER (KV-HA21M80 (VIETNAM))
*	4-086-423-01	CUSHION, UPPER (KV-HA21M60/HA21P52)
*	4-085-464-01	CUSHION, UPPER (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
*	4-086-890-01	CUSHION, UPPER (KV-HA21M80 (VIETNAM))
*	4-085-479-01	INDIVIDUAL CARTON (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
*	4-086-425-01	INDIVIDUAL CARTON (KV-HA21M60/HA21P52)
*	4-086-892-01	INDIVIDUAL CARTON (KV-HA21M80 (VIETNAM))
	4-392-003-11	BAND, HOLD (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
	4-392-003-51	BAND, HOLD (KV-HA21M80 (VIETNAM))
	4-392-003-21	BAND, HOLDING (KV-HA21M60/HA21P52)
	4-392-004-11	CLIP (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
*	4-039-372-01	BAG, PROTECTION (EXCEPT KV-HA21M60/HA21P52)
*	4-037-760-01	BAG, PROTECTION (KV-HA21M60/HA21P52)
	4-392-004-11	CLIP (KV-HA21M50/HA21M80(E)/HA21M80/H/HA21M81)
	4-059-705-01	CLIP (KV-HA21M60/HA21P52)

****

BATTERY COVER REMOTE COMMANDER
****

	1-477-047-11	REMOTE COMMANDER (RM-969)
	4-084-290-01	BATTERY COVER REMOTE COMMANDER

SUPPLEMENT-1 BG2T CHASSIS

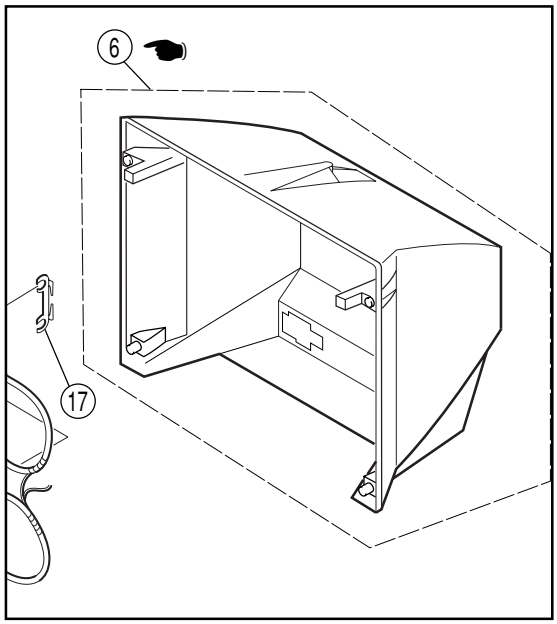
MODEL	COMMANDER	DEST.	CHASSIS NO.	MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-HA21M50	RM-969	Malaysia	SCC-U71D-A				
KV-HA21M60	RM-969	Thailand	SCC-U73L-A				
KV-HA21M80	RM-969	E	SCC-U68D-A				
KV-HA21M80	RM-969	Vietnam	SCC-U75B-A				
KV-HA21M80/H (DOLPHIN GRAY)	RM-969 (BLACK)	ME	SCC-U67K-A				
KV-HA21M81	RM-969	ME	SCC-U67J-A				
KV-HA21P52	RM-969	Thailand	SCC-U73K-A				

SUBJECT : REAR COVER ASSY SUFFIX CHANGE

SECTION 6. EXPLODED VIEWS

6-1. PICTURE TUBE AND CHASSIS

(see page 55 ~ 56)



REF. NO.	PART NO.	DESCRIPTION	REMARK
6	X-4039-650-2	COVER ASSY, REAR (■ 10 SCREWS)	

Sony Corporation
Sony Technology Malaysia Sdn. Bhd.
Visual Products

9-872-274-02

English